Vol. 987 Number 3

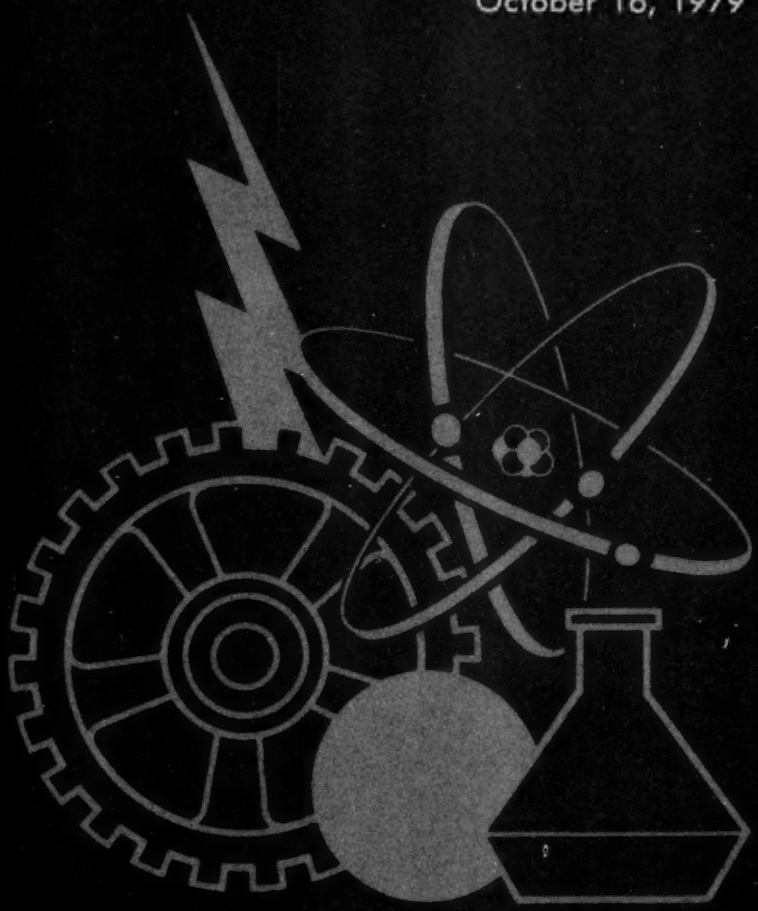
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 16, 1979



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 16, 1979 Volume 987 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information	987 OG 14
April–June 1979 Classification Orders	987 OG 14
Set XI of Addenda to the Classification Definitions	987 OG 14
Patent Suits	987 OG 15
Reissue Applications	987 OG 16
Patent Notices	
Certificates of Correction for the Week of October 16, 1979	987 OG 17
Disclaimers	987 OG 17
Dedications	987 OG 17
Patents Available for Licensing or Sale	987 OG 17
National Technical Information Service	987 OG 18
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	987 OG 21
Condition of Patent Applications	987 OG 22
Reissue Patents Granted (30,112)	515
Plant Patents Granted (4,464)	519
Patents Granted	
General and Mechanical (4,170,792)	521
Chemical (4,171,202)	665
Electrical (4,171,462)	741
Design Patents Granted (253,136)	769
Index of Patentees	PI 1
Indices of Applicants of Defensive Publications, Reisues, Plants and Designs	PI 28
Classification of	
Patents (Including Reissues)	PI 31
Designs and Plants	PI 33
Geographical Index of Residence of Inventors	
Patents (Including Reisues)	PI 34
Designs and Plants	PI 35
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

GENERAL INFORMATION concerning TRADEMARKS, price $1.50 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	**$190.00**
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	**3.50**
Designation fee under PCT Rule 15.1(ii)	**45.00**

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

July 3, 1979.

April–June 1979: Classification Orders

The reclassifications covered by the following classification changes became effective between April and June 1979.

	Class	Subclasses
Classification Order 674, effective April 3, 1979:		
Abolished	307	88; 88.3.
Established	307	400–430.
Classification Order 675, effective April 3, 1979:		
Abolished	156	583.
Established	156	583.1–583.91.
Classification Order 676, effective April 3, 1979:		
Abolished	51	131; 164.
Established	51	131.1–131.5; 164.1; 164.2.
Classification Order 677, effective April 6, 1979:		
Abolished	360	72; 74; 96; 130.
Established	360	72.1–72.3; 74.1–74.7; 96.1–96.6; 130.1; 130.2; 130.21–130.24; 130.3; 130.31—130.34.
Classification Order 678, effective April 9, 1979:		
Abolished	112	203–216; 262–269.
Established	112	262.1–262.3; 263.1; 264.1; 265.1; 265.2; 266.1; 266.2; 267.1; 268.1; 269.1; 303–324.
Title change	112	121.24.
Classification Order 679, effective May 7, 1979:		
Abolished	5	91; 92; unnumbered subclass "Bed bottoms" following subclass 185; 317–345; 365–367; 349; 350; 368–371; 347; 351–353; 353.1–353.8; 354–364.
Established	5	400–513.
Classification Order 680, effective May 8, 1979:		
Abolished	73	80.
	128	2; 2.05; 2.06; 2.07; 2.08; 2.1; 404–418; Digests 4; 5; 17; 29.
Classification Order 680, effective May 8, 1979:		
Established	128	630–804; Cross-Reference Art Collections, 900–908.
Position changes	128	305.3; 305.5.
Title changes	128	1.1; 1.3.
Classification Order 681, effective May 15, 1979:		
Abolished	222	193; 194.
	243	All.
	302	All.
Established	222	630–637.
	(New)	1–198.
	406	
Classification Order 682, effective May 25, 1979:		
Abolished	252	89.
Established	252	89.1; 174.11–174.19; 174.21–174.25.
Classification Order 683, effective May 26, 1979:		
Abolished	44	80.
	252	59.
	260	666–683.9.
Established	208	Cross-Reference Art Collections, 950.
	(New)	1–27; 240; 241; 250–277;
	585	300–304; 310–332; 350–380; 400–489; 500–541; 600–671; 700–752; 800–868; 899; Cross-Reference Art Collections, 900–906; 910–914; 920–926; 930–935; 940–947; 950–956.
Classification Order 684, effective May 31, 1979:		
Abolished	90	All.
Established	408	83.5.
	(New)	1–348; Cross-Reference Art
	409	Collections, 901–904.
Classification Order 685, effective June 7, 1979:		
Abolished	210	96; 257.
Established	210	96.1; 96.2; 257.1; 257.2.
Classification Order 686, effective June 14, 1979:		
Abolished	210	152.
Classification Order 687, effective June 14, 1979:		
Abolished	210	195.
Established	210	195.1–195.4.
Classification Order 688, effective June 15, 1979:		
Abolished	35	10.2.
Established	35	10.21–10.27.
Classification Order 689, effective June 22, 1979:		
Abolished	280	744–747.
	297	384–390.
Established	280	801–808.
	297	464–488.
Classification Order 690, effective June 26, 1979:		
Abolished	118	1–12; 48; 49; 49.1; 49.5; 646.
Established	118	663–733;Cross-ReferenceArt Collections, 900.
Classification Order 691, effective June 27, 1979:		
Abolished	33	75–120.
Established	33	403–500.

ALFRED C. MARMOR,
Administrator for Documentation,
July 30, 1979.

Set XI of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders issued between January 1, 1979 and March 31, 1979. All of these addenda have been consolidated into Set XI of "Addenda to the Classification Definitions."

Class	Class	Class	Class	Class	Class
2	71	165	214	296	354
5	72	166	217	297	356
9	73	169	219	298	358
13	74	171	220	299	361
14	84	172	221	302	362
15	85	173	222	307	363
16	89	174	224	308	364
17	92	175	226	310	365
24	99	176	227	312	366
27	100	177	228	313	400
29	102	178	235	314	401
30	105	179	239	315	403
32	106	180	241	318	405
34	108	181	242	320	408
35	109	182	244	322	414
37	110	185	246	323	415
40	114	186	248	324	422
42	115	187	249	325	424
43	116	188	250	328	425
46	118	190	251	329	428
48	128	191	254	330	431
49	131	192	258	331	432
51	134	193	264	332	
52	135	196	266	333	
53	137	198	267	334	
56	138	200	269	335	
58	139	201	271	336	
59	141	202	273	337	
60	142	206	280	340	
62	144	209	281	343	
63	150	210	283	346	
65	152	211	285	350	
66	160	212	293	352	
70	162	213	294	353	

The following newly established classes issued between January and March, 1979: Classes D3, D17, D18, D20, D21, 414.

ALFRED C. MARMOR,
Administrator for Documentation,
July 30, 1979.

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

2,896,808, Edward C. Rowley, BOX-LIKE STRUCTURE; **3,945,601,** same, KNOCK-DOWN REUSABLE COLUMN FORM; **4,024,077,** same, SAFETY CLIP MEANS FOR REUSABLE SHIPPING CONTAINER, **filed** June 12, 1978, D.C., M.D. Fla. (Tampa), Doc. 78–465–C T.R., *Edward C. Rowley* v. *Custom Forms Manufacturing Co.* Joint stipulation for dismissal without prejudice and order dismissing case without prejudice filed Apr. 23, 1979.

3,133,610, William L. Sheppard, SPEED GOVERNING SYSTEM, **filed** Nov. 13, 1978, D.C., E.D. Mich. (Detroit), Doc. 78–72884, *Eaton Corp.* v. *Rex Industries, Inc. and William L. Sheppard.* Stipulation and order of dismissal with prejudice filed July 25, 1979.

3,195,868, Loomans and Brennan, CONTINUOUS MIXER, **filed** July 20, 1979, D.C.N.J. (Newark), Doc. C–79–2182, *Werner & Pfleiderer Corporation* v. *Baker Perkins, Inc.* **Same, filed** Aug. 14, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–1701, *Baker Perkins Inc.* v. *Gulf Oil Corporation.*

3,260,028, R. Lee Fraser, METHOD OF CONSTRUCTING A BUILDING, **filed** June 15, 1972, D.C., N.D. Calif. (San Francisco), Doc. C–72–1107 WAI, *International Environmental Dynamics, Inc.* v. *R. Lee Fraser.* Plaintiff's complaint dismissed with prejudice on July 27, 1979.

3,396,067, Kenneth A. Schafer, RESINOUS PRODUCT SIMULATING ONYX; **D. 242,859,** George S. Gruber, VANITY BASIN, **filed** Mar. 26, 1979, D.C., C.D. Calif. (Los Angeles), Doc. CV–79–1156 MML, *Larry Singer and Gruber Systems, Inc.* v. *Podnar & Sons, Inc. and Onyx Creations, Inc.*

3,409,579, Ashland Oil & Refining Company, FOUNDRY BINDER COMPOSITION COMPRISING BENZYLIC ETHER RESIN, POLYISOCYANATE, AND TERTIARY AMINE; **3,676,392,** Ashland Oil, Inc., RESIN COMPOSITIONS, **filed** Nov. 14, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–731, *Ashland Oil, Inc.* v. *C. E. Cast Industrial Products Combustion Engineering, Inc.*

3,513,743, David M. Montguire, MULTIPLE-HEAD SLITTING APPARATUS; **Re. 27,918,** same, **filed** July 16, 1979, D.C., N.D. Ohio (Youngstown), Doc. C–79–1392–Y, *H. R. Braner Engineering, Inc.* v. *Paxson Machine Co.*

3,514,765, Shell Oil Company, SENSE AMPLIFIER COMPRISING CROSS COUPLED MOSFET'S OPERATING IN A RACE MODE FOR SINGLE DEVICE PER BIT MOSFET MEMORIES; **3,678,473,** same, READ-WRITE CIRCUIT FOR CAPACITIVE MEMORY ARRAYS, **filed** Jan. 17, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3–79–0057, *Shell Oil Company* v. *Intel Corporation.*

3,552,469, B & J Manufacturing Company, TIRE BEAD SEATER; **3,675,705,** same, TIRE BEAD SEATING AND INFLATION APPARATUS; **3,805,871,** same, TIRE MOUNTING, BEAD SEATING AND INFLATION APPARATUS AND METHOD OF USE, **filed** Feb. 6, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c402, *B and J Mfg.* v. *Royal Industries and Rubber Inc.* Complaint against Rubber, Inc. dismissed with prejudice. Consent judgment entered on Oct. 5, 1978.

3,613,133, Isola and Miller, BED CLOTHES, **filed** Nov. 30, 1978, D.C., E.D. Mich. (Detroit), Doc. 78–73090, *Richard A. Isola* v. *M. Lowenstein & Sons, Inc.*

3,615,087, Ronald P. Hickman, WORKBENCHES; **4,076,229,** same, **filed** Oct. 3, 1978, D.C., E.D. Mo. (St. Louis), Doc. 78–1050C(3), *Emerson Electric Co.* v. *The Black and Decker Manufacturing Company et al.* Order dismissing plaintiff's complaint for lack of jurisdiction granted. Proceedings transferred to U.S. District Court of Maryland on Dec. 6, 1978.

3,622,980, Casell Company, Inc., DIRECTIONAL WARNING SYSTEM, **filed** Nov. 20, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–2766–FW, *Casell Company Inc.* v. *Royal Industries, Inc.* Judgment and order dismissing case filed on Dec. 29, 1976.

3,627,300, Panduit Corp., WIRE CABLE HARNESS ASSEMBLY APPARATUS; **Re. 29,037,** same, **filed** Dec. 14, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c4974, *Panduit Corp.* v. *Thomas & Betts Corp.*

3,627,051, Schmitz, Suby, Ransom and Rhodes, DEBRIS-GATHERING MEANS, **filed** May 10, 1979, D.C. Minn. (Minneapolis), Doc. C4–79–218, *Rockland, Inc.* v. *R & W Welding & Machine, Inc.*

3,645,587, Bill G. Parker, DRILL STRING MEMBER AND METHOD FOR MANUFACTURE, **filed** Dec. 1, 1978, D.C., W.D. La. (Shreveport), Doc. 781542, *Tri-Collar, Inc.* v. *Basco, Inc. and Sam L. Bass.*

3,665,563, John Thomas Batts, Inc., CLAMP, **filed** Mar. 17, 1978, D.C. Mass. (Boston), Doc. ca 78–629–F, *John Thomas Batts Inc.* v. *JAM Plastics Inc.*

3,675,705. (See 3,552,469.)

3,676,392. (See 3,409,579.)

3,676,966, Ragland Manufacturing & Construction Co., DOOR-FRAME ASSEMBLY, **filed** Aug. 15, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–1703, *Ragland Manufacturing & Construction Co.* v. *Commercial Dry Walls, Inc.*

3,677,747, Martin Marietta Corporation, HIGH TEMPERATURE CASTABLE ALLOYS AND CASTINGS; **3,720,509,** same, NICKEL BASE ALLOY, **filed** May 5, 1978, D.C. Del. (Wilmington), Doc. 78–174, *Martin Marietta Corporation* v. *Howmet Corporation.* Stipulation and order dismissing case without prejudice filed Jan. 22, 1979.

3,678,473. (See 3,514,765.)

3,714,786, Ralph E. Evans, DRAINAGE CULVERT, **filed** Mar. 2, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–403, *Armco Inc.* v. *Ramco Steel, Inc.*

3,720,509. (See 3,677,747.)

3,721,051, H. H. Robertson Company, BOTTOMLESS SUB-ASSEMBLY FOR PRODUCING AN UNDERFLOOR ELECTRICAL CABLE TRENCH, **filed** Aug. 8, 1979, D.C.N.J. (Newark), Doc. Civ. No. 79–2344, *H. H. Robertson Company* v. *Rollform Products, Inc.*

3,748,640, Vincent Sardo Jr., SEAT BELT SYSTEM FOR AUTOMOTIVE VEHICLES; **Re. 28,804,** same, **filed** Aug. 6, 1979, D.C., S.D.N.Y., Doc. 79–C–4074, *Vincent Sardo, Jr.* v. *Ford Motor Company.*

3,778,699, Societe Anonyme des Etablissements Adrien de Backer N.V., RESONANT TYPE CURRENT REGULATOR PROVIDING A CONTINUOUS REGULATION, **filed** July 25, 1979, D.C. Conn. (Hartford), Doc. H79–417, *Societe Anonyme des Etablissements Adrien de Backer N.V.* v. *Crouse-Hinds Sepco Corporation.*

3,797,779, Sony Corporation, TAPE CASSETTE; **3,900,170,** same; **3,900,171,** same; **3,900,172,** same; **3,921,927,** same, TAPE REEL; **3,934,839,** same, TAPE CASSETTE; **3,971,071,** same, TAPE CASSETTE WITH GUIDE MEANS FOR UNIDIRECTIONAL INSERTION AND HOLDER THEREFORE; **3,980,255,** same, TAPE CASSETTE; **4,091,168,** same, LEADER FOR MAGNETIC RECORDING TAPE HAVING COEXTENSIVE FLEXIBLE LAYERS WITH METAL LAMINATED THEREBETWEEN; **D. 247,778,** same, TAPE CASSETTE CASE, **filed** July 27, 1979, D.C., S.D. Fla. (Fort Lauderdale), Doc. 79–3310–C–NCR, *Sony Corporation* v. *Krimis Video, Inc.*

3,805,871. (See 3,552,469.)

3,868,670, Joseph O'Nory, CUSTOMER SERVICE DISPLAY; Reg. No. 1,073,493 (TELL-O-MATIC AND DESIGN), Joseph O'Nory, doing business as Advance Electro Systems, **filed** Apr. 24, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–1489–MRP (Sx), *Joseph O'Nory* v. *Patricia Properties, Ltd.*

3,900,170. (See 3,797,779.)

3,900,171. (See 3,797,779.)

3,900,172. (See 3,797,779.)

3,913,530, A. E. Smith, INSECTICIDE APPLICATOR FOR ANIMALS, **filed** July 26, 1979, D.C. Nebr. (Omaha), Doc. CV 79–0–381, *Doctor Scratch Co., Inc.* v. *Supreme Products, Inc. and Gaylord Crawford.*

3,921,927. (See 3,797,779.)

3,934,839. (See 3,797,779.)

3,945,601. (See 2,896,808.)

3,971,071. (See 3,797,779.)

3,980,255. (See 3,797,779.)

4,024,977. (See 2,896,808.)

4,076,229. (See 3,615,087.)

4,091,168. (See 3,797,779.)

Re. 27,918. (See 3,513,743.)

Re. 28,176, George F. Horton, BRACKET FOR MOUNTING BOAT ACCESSORY, **filed** Aug. 13, 1979, D.C., N.D. Tex. (Fort Worth), Doc. CA–4–79–310, *George F. Horton* v. *S. C. Johnson & Sons, Inc. and Anderson-Needham Sales Co.*

Re. 28,804. (See 3,748,640.)

Re. 29,037. (See 3,627,300.)

D. 225,954, Michael Schachel, COMBINED CLOTHES RACK AND STORAGE SHELF UNIT, **filed** July 20, 1979, D.C., S.D. Fla. (Miami), Doc. 79–3206–C–WMH, *Michael Schachel and I.C.O. Corp., Inc.* v. *Jack M. Cooper et al.*

D. 242,859. (See 3,396,067.)

D. 243,217, Ernest E. Warsaw, SOFA, **filed** June 29, 1978, D.C., C.D. Calif. (Los Angeles), Doc. 78–2510–WPG, *Sheffield Furniture Corporation* v. *California Convertible Sofas, Inc.* Consent judgment and order enjoining defendant from further use etc. of plaintiff's patent filed Aug. 13, 1979.

D. 243,330, Optyl Corporation, EYEGLASS FRAME, **filed** June 26, 1978, D.C., N.D. Calif. (San Francisco), Doc. C–78–1394–SAW, *Optyl Corporation* v. *Optimark Corp.* Defendant is permanently enjoined against infringing plaintiff's patent. Entered May 11, 1979.

D. 244,647, Fratelli Saporiti Industrial Arredamenti Di Saporiti, Sergio E Giorgio S.N.C., ARMCHAIR, **filed** Nov. 11, 1977, D.C., M.D.N.C. (Greensboro), Doc. C–77–532–G, *Fratelli Saporiti Industria Arredamenti Di Saporiti, Sergio E Giorgio S.N.C.* v. *Braden International, Inc.* Consent judgment entered on Aug. 15, 1979 that defendant has infringed plaintiff's patent No. Design 244,647.

D. 247,778. (See 3,797,779.)

D. 247,946, Dart Industries Inc., AN ELECTRIC COOKING BASE AND VESSEL, **filed** Feb. 7, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–0507–IH, *Dart Industries Inc.* v. *Winnie Mae Manufacturing Co., Inc. and American Electric Corporation.*

D. 249,318, Graser and Ludvigsen, MICROWAVE OVEN, **filed** Apr. 27, 1979, D.C., N.D. Ala. (Birmingham), Doc. CA 79–M–0466–E, *Litton Systems, Inc.* v. *Magic Chef, Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,772,303, Re. S.N. 943,996, Filed Sep. 20, 1978, Cl. 260/282, CIS-NAPHTHOYLENE-BIS-BENZIMIDAZOLE PIGMENT AND PROCESS FOR ITS MANUFACTURE, Ernst Spietschka, et al., Owner of Record: *Hoechst Aktiengesellschaft, Frankfurt/Main, Germany,* Attorney or Agent: Henry W. Koster, Ex. Gp.: 122

3,856,052, Re. S.N. 016,680, Filed Apr. 25, 1979, Cl. 138/119, HOSE STRUCTURE, Robert H. Feucht, Owner of Record: *The Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: R. P. Yaist, et al., Ex. Gp.: 243

3,876,498, Re. S.N. 043,105, Filed May 29, 1979, Cl. 162/199, CONTROLLED FORMING WIRE SEPARATION ON IMPERVIOUS ROLL OR TWIN-WIRE PAPER-MAKING MACHINE, Edgar J. Justus, Owner of Record: *Beloit Corporation, Beloit, Wis.,* Attorney or Agent: Benjamin H. Sherman, Ex. Gp.: 173

3,913,709, Re. S.N. 021,053, Filed Mar. 16, 1979, Cl. 188/734, SPOT-TYPE DISC BRAKE, Jochen Burgdorf, et al., Owner of Record: *ITT Industries, Inc., New York, N.Y.,* Attorney or Agent: Walter J. Baum, et al., Ex. Gp.: 315

3,969,148, Re. S.N. 013,942, Filed Feb. 22, 1979, Cl. 429/100, ADAPTER FOR DRY CELL BATTERIES, Burton C. Trattner, Owner of Record: *Inventor,* Attorney or Agent: Albert C. Nolte, Jr., et al., Ex. Gp.: 114

3,969,148, Re. S.N. 019,941, Filed Feb. 22, 1979, Cl. 429/100, ADAPTER FOR DRY CELL BATTERIES, Burton C. Trattner, Owner of Record: *Inventor,* Attorney or Agent: Albert C. Nolte, Jr., et al., Ex. Gp.: 114

3,996,297, Re. S.N. 031,645, Filed May 16, 1979, Cl. 568/750, PROCESS FOR PURIFICATION OF 2,6-XYLENOL, Bruce E. Leach, et al., Owner of Record: *Continental Oil Co., Ponca City, Okla.,* Attorney or Agent: Joseph C. Kotarski, et al., Ex. Gp.: 126

3,998,881, Re. S.N. 927,794, Filed Jul. 25, 1978, Cl. 260/563 R, HYDROGENATION OF PHTHALO-NITRILES USING RHODIUM CATALYST, Walter Albert Butte, Jr., et al., Owner of Record: *Sun Ventures, Inc., St. Davids, Pa.,* Attorney or Agent: J. Edward Hess, et al., Ex. Gp.: 111

4,004,830, Re. S.N. 052,666, Filed Jun. 27, 1979, Cl. 280/763, LANDING GEAR CONSTRUCTION, Jack T. Belke, Owner of Record: *Westran Corporation, Muskegon, Mich.,* Attorney or Agent: Ernest I. Gifford, et al., Ex. Gp.: 316

4,027,651, Re. S.N. 026,037, Filed Apr. 2, 1979, Cl. 126/270, SOLAR-ENERGY-POWERED SUN TRACKER, Roland W. Robbins, Owner of Record: *Inventor,* Attorney or Agent: Gerald F. Baker, Ex. Gp.: 345

4,034,475, Re. S.N. 052,966, Filed Jun. 28, 1979, Cl. 32/21, DENTAL APPARATUS, Robert L. Lee, Owner of Record: *Inventor,* Attorney or Agent: Louis J. Knobbe, et al., Ex. Gp.: 333

4,036,201, Re. S.N. 051,983, Filed Jun. 25, 1979, Cl. 123/148, SINGLE CORE CONDENSER DISCHARGE IGNITION SYSTEM, Bob O. Burson, Owner of Record: *R. E. Phelon Company, Inc., East Longmeadow, Mass.,* Attorney or Agent: Alonzo L. Neal, et al., Ex. Gp.: 242

4,051,053, Re. S.N. 950,047, Filed Oct. 10, 1978, Cl. 252/78.3, HYDRAULIC FLUIDS COMPRISING ORTHOSILICATE ESTERS, John Scotchford Elliott, et al., Owner of Record: *Castrol Limited, Swindon, England,* Attorney or Agent: Leo A. Rostta, et al., Ex. Gp.: 166

4,056,985, Re. S.N. 052,975, Filed Jun. 28, 1979, Cl. 74/435, HINGE STRUCTURES, Anthony C. Worrallo, Owner of Record: *Inventor,* Attorney or Agent: D. C. Roylance, et al., Ex. Gp.: 352

4,086,370, Re. S.N. 000,542, Filed Jan. 2, 1979, Cl. 426/613, TOPPING FOR FROZEN DESSERTS AND METHOD OF MANUFACTURE, Dale F. Olds, et al., Owner of Record: *Patent Technology Inc., San Francisco, Calif.,* Attorney or Agent: Paul D. Flehr, et al., Ex. Gp.: 172

4,089,515, Re. S.N. 053,865, Filed Jul. 2, 1979, Cl. 271/3, DOCUMENT STORAGE AND TRANSPORT APPARATUS, Klaus L. Stange, et al., Owner of Record: *Xerox Corporation, Stamford, Conn.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 313

4,111,316, Re. S.N. 052,462, Filed Jun. 27, 1979, Cl. 44/550, TRUCK MOUNTED HOIST, Joachim H. R. Wappler, Owner of Record: *Inventor,* Attorney or Agent: George A. Rolston, Ex. Gp.: 314

4, 142,677, Re. S.N. 051,710, Filed Jun. 25, 1979, Cl. 236/101 E, FUEL VAPOR VENT VALVE, George C. Ludwig, Owner of Record: *Tom McGuane Industries, Inc., Farmington Hills, Mich.,* Attorney or Agent: Arthur Raisch, et al., Ex. Gp.: 344

PATENT NOTICES

Certificates of Correction for the Week of Oct. 16, 1979

Re. 29,859	4,141,792	4,150,551	4,157,127
D. 252,472	4,142,982	4,150,858	4,157,142
3,674,728	4,143,004	4,150,970	4,157,155
3,738,809	4,143,153	4,151,000	4,157,164
4,000,171	4,143,463	4,151,128	4,157,385
4,011,362	4,143,513	4,151,632	4,157,401
4,019,579	4,149,916	4,151,658	4,157,462
4,019,580	4,144,215	4,151,708	4,157,904
4,040,868	4,144,394	4,152,023	4,157,905
4,048,582	4,144,910	4,152,301	4,158,081
4,080,896	4,145,065	4,152,340	4,158,167
4,083,396	4,145,331	4,152,497	4,158,521
4,084,744	4,145,377	4,152,786	4,159,011
4,084,991	4,145,420	4,153,063	4,159,214
4,087,343	4,145,621	4,153,343	4,159,257
4,087,397	4,146,614	4,153,432	4,159,261
4,093,854	4,146,652	4,153,508	4,159,341
4,095,806	4,146,805	4,153,546	4,159,439
4,096,792	4,146,871	4,153,662	4,160,025
4,098,224	4,147,208	4,153,936	4,160,052
4,103,337	4,147,350	4,154,607	4,160,142
4,108,850	4,147,603	4,154,750	4,160,220
4,110,443	4,147,620	4,154,763	4,160,282
4,112,494	4,147,651	4,154,863	4,160,372
4,121,222	4,147,683	4,154,920	4,160,578
4,125,653	4,147,688	4,154,954	4,160,619
4,130,547	4,147,820	4,155,134	4,160,962
4,131,575	4,148,087	4,155,402	4,161,012
4,134,119	4,148,113	4,155,721	4,161,210
4,134,842	4,148,587	4,155,761	4,161,222
4,136,693	4,148,690	4,155,952	4,161,937
4,137,341	4,148,691	4,156,021	4,162,305
4,139,542	4,148,869	4,156,450	4,162,349
4,139,574	4,149,261	4,156,601	4,162,389
4,140,473	4,149,294	4,156,649	4,162,596
4,140,514	4,150,050	4,156,667	4,162,952
4,141,414	4,150,258	4,156,766	4,162,962
4,141,620	4,150,484	4,157,046	4,163,132

Disclaimers

3,761,647.—*Mitsuo Nemoto* and *Kimiyasu Honma,* Tokyo, Japan. CARTRIDGE FOR DETECTING VIBRATIONS REPRESENTING STEREOPHONIC SOUND. Patent dated Sept. 25, 1973. Disclaimer filed Aug. 14, 1979, by the assignee, *Kabushiki Kaisha Audio-Technica.*

Hereby enters this disclaimer to claims 2, 3 and 6 of said patent.

3,848,786.—*James S. Baxter,* Oxford, Mich. PIPE SUPPORTING RACK FOR VEHICLE. Patent dated Nov. 19, 1974. Disclaimer filed Sept. 7, 1979, by the inventor.

Hereby enters this disclaimer to claim 1 of said patent.

4,071,924.—*Pieter Meyn, Oostzaan,* Netherlands. APPARATUS FOR REMOVING A FOWL FROM A CONVEYOR. Patent dated Feb. 7, 1978. Disclaimer filed July 27, 1979, by the inventor.

Hereby enters this disclaimer to claims 1–4 of said patent.

"Patent Laws" Booklet

A 1979 edition of the Patent and Trademark Office's "Patent Laws" booklet is now available from the Superintendent of Documents. The 1979 revisions incorporate provisions concerning the Patent Cooperation Treaty into the text of Title 35 of the United States Code and otherwise update the booklet. Copies may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, at $4.50 per copy. The stock number is 003–004–00561–1.

Sept. 20, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Dedications

3,175,351.—*Godfrey Bloch,* New York, N.Y. METHOD FOR MAKING BULKED CONTINUOUS FILAMENT YARNS. Patent dated Mar. 30, 1965. Dedication filed Aug. 13, 1979, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby dedicates to the Public the remaining term of said patent.

3,564,438.—*Allen L. Limberg,* Somerville, N.J. SIGNAL TRANSLATING CIRCUIT HAVING FIRST AND SECOND PAIRS OF SEMICONDUCTOR DEVICES WITH MATCHING CONDUCTION CHARACTERISTICS. Patent dated Feb. 16, 1971. Dedication filed Aug. 14, 1979, by the assignee, *RCA Corporation.*

Hereby dedicates the entire remaining term of said patent to the Public.

Patents Available for Licensing or Sale

3,927,709. OVERHEAD GARAGE DOOR. Wilbur R. Anderson and Lydia H. Anderson. 2405 Nichol Ave., Anderson, Ind. 46011.

4,078,643. TOKEN OPERATED CONTROL SYSTEM FOR A MULTITRACK TAPE CARTRIDGE PLAYER. David Benjamin Warthan, 668 E. French Camp Rd., French Camp, Calif. 95231.

4,143,761. SAFETY MATCH BOOK. Francis P. Brand, 11 Curley St., Long Beach, N.Y. 11561.

4,162,580. WIG DRYING ATTACHMENT FOR HAIR DRYERS. Georgia E. Hess, 910 N. Madison, Benton, Ill. 62812.

4,165,073. WATER GUN GAME WITH REVOLVABLE TARGET MOVABLE ALONG A LINE. Donald L. Kellerstrass, 303 Daniel Parkway, Washington, Ill. 61571.

General Electric Company is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

4,027,123. VACUUM CIRCUIT BREAKER COMPRISING SERIES CONNECTED VACUUM INTERRUPTERS AND CAPACITIVE VOLTAGE-DISTRIBUTION MEANS.

4,060,786. ELECTRIC FUSE WITH SEALED INDICATOR.

4,091,353. CURRENT LIMITING FUSE.

Applications for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

D 252,067. COMBINED MICROWAVE OVEN FRONT DOOR AND FRAME.

3,484,769. TIMING DEVICE WITH OPTIONAL SIGNAL.

3,525,138. METHOD OF MAKING A HUMIDIFIER EVAPORATING ELEMENT.

3,544,849. SOLID STATE TEMPERATURE CONTROL MEANS.

3,565,466. MEANS TO CONNECT A CONDUIT TO A CONTAINER.

3,732,030. BLOWER WHEEL ASSEMBLY.

3,860,788. OPEN WIRE HEATER ELEMENT SUPPORT.

3,897,806. LIQUID FLOW DIVERSION ARRANGEMENT.

4,000,779. BLOWOFF BAFFLE.

4,002,285. METHOD OF METALLURGICALLY JOINING TUBING.

4,032,750. FLAT PLATE HEATING UNIT WITH FOIL HEATING MEANS.

4,121,461. ELECTRONIC TEMPERATURE SENSOR.

4,136,291. CAPACITIVE TOUCH-PAD DEVICES WITH DYNAMIC BIAS.

4,138,665. PREAMPLIFIER FOR ANALOG TO DIGITAL CONVERTERS.

4,138,666. CHARGE TRANSFER CIRCUIT WITH THRESHOLD VOLTAGE COMPENSATING MEANS.

4,144,527. DUAL-SLOPE ANALOG TO DIGITAL CONVERTERS.

4,145,689. A/D CONVERTER.

4,157,153. ALUMINUM TUBE JOINT DESIGN.

4,158,294. REFRIGERATOR HAVING CABINET WARMING HEAT TRANSFER DEVICE.

4,160,225. TEMPERATURE RESPONSIVE CONTROL DEVICE WITH IMPROVED HYDRAULIC DIAPHRAGM.

Application for license may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,128,939. PEELING CUTTER.

4,163,963. PROBE CONTROL.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 and $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Service Division, Federal Building, Agricultural Research Service Hyattsville, Md. 20782

Patent application 6–020,359. Sampling Circuit and Method Therefor. Filed Mar. 14, 1979.

Patent application 6–024,551. Process for the Preparation of Cellulose Ether Derivatives. Filed Mar. 28, 1979.

Patent application 6–025,135. Sex Attractant for Tobacco Moths. Filed Mar. 29, 1979.

Patent application 974,171. Antibacterial Textile Finishes Utilizing Zinc Acetate and Hydrogen Peroxide. Filed Dec. 28, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch Westwood Bldg., Bethesda, Md. 20205

Patent application 6–024,246. N-Acetyl-Cysteine Protects Against Cardiac Damage From Subsequently-Administered Adriamycin in Cancer Therapy. Filed Mar. 27, 1979.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW., Washington, D.C. 20240

Patent application 6–001,026. Method of Recovering Lead Through the Direct Reduction of Lead Chloride by Aqueous Electrolysis. Filed Jan. 4, 1979.

Patent application 6–002,829. Recycling Spent Asphaltic Concrete. Filed Jan. 12, 1979.

Patent application 6–008,298. Recovery of Gallium From Acid Process Solution. Filed Jan. 31, 1979.

TENNESSEE VALLEY AUTHORITY

Division of Law, Muscle Shoals, Ala. 35660

Patent 4,152,402. Partial Purification of Wet-Process Phosphoric Acid With Acetone and Ammonia. Filed Feb. 24, 1978. Patented May 1, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent application 6–006,952. Surface Finishing. Filed Jan. 25, 1979.

Patent application 6–017,888. Method for Separating Biological Cells. Filed Mar. 6, 1979.

Patent application 6–023,485. Pulse Switching for High Energy Lasers. Filed Mar. 23, 1979.

Patent application 6–025,163. Multispectral Scanner Optical System. Filed Mar. 29, 1979.

Patent application 856,462. Heat Exchanger and Method of Making. Filed Nov. 30, 1977.

Patent 3,131,040. Water Separator. Filed Dec. 23, 1960. Patented Apr. 28, 1964. Not available NTIS.

Patent 3,311,571. Infusible Silazane Polymer and Process for Producing Same. Filed Aug. 30, 1965. Patented Mar. 28, 1967. Not available NTIS.

Patent 3,396,719. Metabolic Rate Meter and Method. Filed July 2, 1963. Patented Aug. 13, 1968. Not available NTIS.

Patent 3,419,531. Fluorine-Containing Polyformals. Filed June 3, 1966. Patented Dec. 31, 1968. Not available NTIS.

Patent 3,453,878. Wind Tunnel. Filed June 22, 1967. Patented July 8, 1969. Not available NTIS.

Patent 3,487,765. Protective Garment Ventilation System. Filed Oct. 6, 1966. Patented Jan. 6, 1970. Not available NTIS.

Patent 3,514,785. Emergency Space-Suit Helmet. Filed Feb. 24, 1966. Patented June 2, 1970. Not available NTIS.

Patent 3,882,417. Gas Ion Laser Construction for Electrically Isolating the Pressure Gauge Thereof. Patented May 6, 1975. Not available NTIS.

Patent 4,145,933. Fatigue Failure Load Indicator. Filed Mar. 24, 1978. Patented Mar. 27, 1979. Not available NTIS.

Patent 4,146,180. Retractable Environmental Seal. Filed Mar. 29, 1978. Patented Mar. 27, 1979. Not available NTIS.

Patent 4,147,980. Redundant RF System for Space Appplication. Filed July 11, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,148,375. Seismic Vibration Source. Filed Aug. 22, 1977. Patented Apr. 10, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE ARMY, OTJAG

Chief, Intellectual Property, Division, Room 2d 444, Pentagon, Washington, D.C. 20310

Patent application 6–007,290. Band Interacting Tunnel Heterojunctions. Filed Jan. 29, 1979.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6–009,728. Lubricant Composition. Filed Feb. 6, 1979.

Patent application 6–010,109. Aircraft Electrical System Tester. Filed Feb. 7, 1979.

Patent application 6–010,202. Retractable Nose Landing Gear. Filed Feb. 8, 1979.

Patent application 6–012,696. Optical Scanning Digitizer. Filed Feb. 16, 1979.

Patent application 6–012,697. Digital Phase-Frequency Detector. Filed Feb. 16, 1979.

Patent application 6–014,519. Economical Fast Scan Spectrometer. Filed Feb. 23, 1979.

Patent application 968,894. Process for Reclaiming Fuel-Contaminated Purging Fluids. Filed Dec. 13, 1978.

Patent application 968,895. Doppler Compensated Digital Non-Linear Waveform Generator Apparatus. Filed Dec. 13, 1978.

Patent application 970,910. Wall Wick for Nickel-Hydrogen Cell. Filed Dec. 19, 1978.

Patent application 970,947. Electromagnetic Interference Filter Window. Filed Dec. 19, 1978.

Patent application 970,948. Method for Reducing the Electrical Charging of Orbiting Spacecraft. Filed Dec. 19, 1978.

Patent application 971,580. High Temperature-Resistant Conductive Adhesive. Filed Dec. 20, 1978.

Patent 4,144,577. Integrated Quartized Signal Smoothing Processor. Filed Oct. 14, 1977. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,145,956. Pilot Operated Stepping Valve. Filed Apr. 25, 1977. Patented Mar. 27, 1979. Not available NTIS.

Patent application 6–010,091. Fuel Flow Distribution System. Filed Feb. 7, 1979.

Patent 4,146,196. Simplified High Accuracy Guidance System. Filed July 20, 1976. Patented Mar. 27, 1979. Not available NTIS.

Patent 4,146,197. Boundary Layer Scoop for the Enhancement Coanda Effect Flow Deflection Over a Wing/Flap Surface. Filed Sept. 16, 1977. Patented Mar. 27, 1979. Not available NTIS.

Patent 4,146,201. Parachute Inspection Arch. Filed Nov. 16, 1977. Patented Mar. 27, 1979. Not available NTIS.

Patent 4,146,808. Thinned Withdrawal Weighted Surface Acoustic Wave Interdigital Transducers. Filed Nov. 10, 1977. Patented Mar. 27, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Service Division, Federal Bldg., Agriculture Research Service Hyattsville, Md. 20782

Patent application 6–001,134. Durable Press Finishing Treatment for Cellulose Textiles Employing an Aluminum Acetate Catalyst Solution. Filed Jan. 5, 1979.

Patent application 6–012,772. High Shear Strength Adhesive for Bonding Nylon to Nylon. Filed Feb. 16, 1979.

Patent application 6–014,406. Process for Photoinitiated, Polymeric Encapsulation of Cotton Fibers in Durable Press Textiles. Filed Feb. 23, 1979.

Patent application 6–015,540. Biological Control System. Filed Feb. 26, 1979.

Patent application 6–018,087. Quarternary Phosphonium Salts Bearing Carbamate Groups. Filed Mar. 6, 1979.

Patent application 6–025,131. Sesbanine and Its Use in Treating Leukemic Tumors. Filed Mar. 29, 1979.

Patent application 6–025,136. Sex Attractant for Corn Earworm Moths. Filed Mar. 29, 1979.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 865,346. Method for the Recovery of Actinide Elements From Nuclear Reactor Waste. Filed Dec. 28, 1977.

Patent application 872,285. Surge-Damping Vacuum Valve. Filed Jan. 25, 1978.

Patent application 881,965. Tool Holder for Preparation and Inspection of a Radiused Edge Cutting Tool. Filed Feb. 28, 1978.

Patent application 881,966. Preset Pivotal Tool Holder. Filed Feb. 28, 1978.

Patent application 882,025. Means for Ultrasonic Testing When Material Properties Vary. Filed Feb. 28, 1978.

Patent application 882,726. Cryogenic Structural Support. Filed Mar. 2, 1978.

Patent 4,082,951. Compton Effect Thermally Activated Depolarization Dosimeter. Filed July 23, 1975. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,083,225. On-Line Ultrasonic Gas Entrainment Monitor. Filed Mar. 17, 1976. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,094,492. Variable Orifice Using an Iris Shutter. Filed Jan. 18, 1977. Patented June 13, 1978. Not available NTIS.

Patent 4,098,132. Ultrasonic Search Wheel Probe. Filed Aug. 17, 1977. Patented July 4, 1978. Not available NTIS.

Patent 4,098,643. Dual-Function Magnetic Structure for Toroical Plasma Devices. Filed Mar. 1, 1976. Patented July 4, 1978. Not available NTIS.

Patent 4,120,172. Heat Transport System. Filed May 5, 1977. Patented Oct. 17, 1978. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–024,247. Method and Apparatus for Cell and Tissue Culture. Filed Mar. 27, 1979.

Patent application 922,732. Cervical Dilater. Filed July 7, 1978.

Patent application 954,876. Synthesis of Analogs of 3′-Phosphoadenosine 5′-Phosphosulfate (PAPS). Filed Oct. 26, 1978.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

Patent application 904,906. Portable Hard Rock Crusher. Filed May 11, 1978.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 4,095,762. GN_2 Accumulator Powered Shaftless Piston for Dependent Dual Ejector Bomb Rack. Filed July 18, 1977. Patented June 20, 1978. Not available NTIS.

Patent 4,135,116. Constant Illumination Control System. Filed Jan. 16, 1978. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,136,340. Sequential Probability Ratio Test for Friend Identification System. Filed Jan. 30, 1978. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,136,725. Motion Compensating Liquid Holding Tank. Filed Jan. 27, 1977. Patented Jan. 30, 1979. Not available NTIS.

Patent 4,139,439. Hydrogen Isotope Separation. Filed May 31, 1978. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,141,506. Combined Radial Diffuser and Control Valve for High-Pressure Fans. Filed July 15, 1977. Patented Feb. 27, 1970. Not available NTIS.

Patent 4,142,171. Efficient Apparatus for Projecting Acoustic Waves. Filed Jan. 10, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,143,520. Cryogenic Refrigeration System. Filed Dec. 23, 1977. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,143,548. Measuring the Speed of an Aircraft. Filed Oct. 26, 1977. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,135,452. Time Delay Computer Using Fuze Doppler for Air-to-Air Missiles. Filed Jan. 9, 1978. Patented Jan. 23, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–028,300. Process for the Preparation of New Elastomeric Polytriazines. Filed Apr. 9, 1979.

Patent application 6–028,301. The 1,2,4-Oxadiazole Elastomers Filed Apr. 9, 1979.

Patent 4,109,213. Digital Automatic Gain Amplifier. Filed Mar. 24, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,145,058. Shaft Seal Assembly for High Speed and High Pressure Applications. Filed July 8, 1977. Patented Mar. 20, 1979. Not available NTIS.

Patent 4,145,255. Method and Device for the Detection of Phenol and Related Compounds. Filed Feb. 25, 1977. Patented Mar. 20, 1979. Not available NTIS.

Patent 4,145,524. Preparation of Heterocyclic Block Copolymer Omega-Diamidoximes. Filed Oct. 17, 1977. Patented Mar. 20, 1979. Not available NTIS.

Patent 4,146,409. Process for Making a High Toughness-High Strength Iron Alloy. Filed Dec. 13, 1977. Patented Mar. 27, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division, Room 2D 444,
Pentagon, Washington, D.C. 20310

Patent application 840,206. Electronic Intruder Detection System. Filed Oct. 7, 1977.

Patent application 966,846. Semi-Durable, Water Repellant, Fire Resistant Intumescent Composition. Filed Dec. 6, 1978.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

Patent application 6–010,092. Diphospha-s-Triazines and Their Synthesis. Filed Feb. 7, 1979.

Patent application 6–010,204. High Power Pulser. Filed Feb. 8, 1979.

Patent application 968,874. Method for the Production of Trialuminum Nickelide Fibers. Filed Dec. 12, 1978.

Patent 4,144,585. Bubble Domain Structures and Method of Making. Filed Aug. 16, 1976. Patented Mar. 13, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 821,870. High Temperature Electronic Gain Device. Filed Aug. 4, 1977.

Patent application 857,649. Pressure Regulator. Filed Dec. 5, 1977.

Patent application 857,650. Microinterferometer Transducer. Filed Dec. 5 ,1977.

Patent application 858,586. Device and Method for Separating Oxygen Isotopes. Filed Jan. 11, 1978.

Patent application 865,162. Rf Transformer. Filed Dec. 28, 1977.

Patent application 865,345. Superconducting Magnet. Filed Dec. 28, 1977.

Patent application 865,347. Method for Recovering Palladium and Technetium Values From Nuclear Fuel Reprocessing Waste Solutions. Filed Dec. 28, 1977.

Patent application 868,584. Electrical Pulse Generator. Filed Jan. 11, 1978.

Patent application 868,636. System for Testing Optical Fibers. Filed Jan. 11, 1978.

Patent application 868,638. Repetitively Pumped Electron Beam Device. Filed Jan. 11, 1978.

Patent application 868,639. Multiple Excitation Regenerative Amplifier Inertial Confinement System. Filed Jan. 11, 1978.

Patent application 868,640. Multipass Laser Amplification With Near-Field Far-Field Optical Separation. Filed Jan. 11, 1978.

Patent application 868,641. Segmented Amplifier Configurations for Laser Amplifier Chains. Filed Jan. 11, 1978.

Patent application 868,642. Fully Relayed Regenerative Amplifier. Filed Jan. 11, 1978.

Patent application 868,643. Composite Solid State Laser Amplifier Discs. Filed Jan. 11, 1978.

Patent application 868,644. Laser System Using Regenerative Amplifier. Filed Jan. 11, 1978.

Patent application 868,952. Spectrometer Employing Optical Fiber Time Delays for Frequency Resolution. Filed Jan. 12, 1978.

Patent application 872,204. Regenerator for Gas Turbine Engine. Filed Jan. 25, 1978.

Patent application 872,284. Method and Apparatus for Producing Cryogenic Intertially Driven Fusion Targets. Filed Jan. 25, 1978.

Patent application 880,254. Heat Rejection System. Filed Feb. 22, 1978.

Patent application 880,677. High Yield Neutron Source. Filed Feb. 23, 1978.

Patent application 880,680. Demountable Externally Anchored Low-Stress Magnet System and Related Method. Filed Feb. 23, 1978.

Patent application 882,024. Device and Method for Electron Beam Heating of a High Density Plasma. Filed Feb. 28, 1978.

Patent application 886,370. Mirror Plasma Apparatus. Filed Mar. 14, 1978.

Patent application 886,377. Interferometer for the Measurement of Plasma Density. Filed Mar. 14, 1978.

Patent application 886,378. Self-Protecting Oscillator. Filed Mar. 14, 1978.

Patent application 893,233. Deuterium Enrichment by Selective Photo-Induced Dissociation of an Organic Carbonyl Compound. Filed Apr. 4, 1978.

Patent application 986,539. Induction Machine. Filed Apr. 14, 1978.

Patent 4,075,680. Capacitance Densitometer for Flow Regime Identification. Filed Jan. 27, 1977. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,093,835. Rotation Sensor Switch. Filed Apr. 4, 1977. Patented June 6, 1978. Not available NTIS.

Patent 4,093,879. Magnetohydrodynamic Electrode. Filed Mar. 1, 1977. Patented June 6, 1978. Not available NTIS.

Patent 4,094,268. Apparatus for Growing HgI_2 Crystals Filed Mar. 30, 1977. Patented June 13, 1978. Not available NTIS.

Patent 4,095,121. Resonantly Enhanced Four-Wave Mixing. Filed Apr. 14, 1977. Patented June 13, 1978. Not available NTIS.

Patent 4,095,471. Tidal Sampler. Filed Apr. 4, 1977. Patented June 20, 1978. Not available NTIS.

Patent 4,101,765. Means for Counteracting Charged Particle Beam Divergence. Filed July 19, 1976. Patented July 18, 1978. Not available NTIS.

Patent 4,105,746. Method and Apparatus for Providing Negative Ions of Actinide-Metal Hexafluorides. Filed Feb. 7, 1977. Patented Aug. 8, 1978. Not available NTIS.

Patent 4,105,921. Isotope Separation. Filed Sept. 28, 1976. Patented Aug. 8, 1978. Not available NTIS.

Patent 4,106,327. Anisotropic Determination and Correction for Ultrasonic Flaw Detection by Spectral Analysis. Filed Nov. 22, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,106,574. Method for Establishing High Permeability Flow Path Between Boreholes. Filed July 7, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,106,982. Production of Carrier-Free $H^{13}CN$. Filed Apr. 1, 1974. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,107,180. Salts of Alkali Metal Anions and Process of Preparing Same. Filed Nov. 29, 1974. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,107,935. High Temperature Refrigerator. Filed Mar. 10, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,108,207. Multiple-Port Valve. Filed Apr. 13, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,109,863. Apparatus for Ultrasonic Nebulization. Filed Aug. 17, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,082. Isotope Separation by Photoselective Dissociative Electron. Filed June 17, 1976. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,257. Raney Nickel Catalytic Device. Filed July 1, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,686. Piezoelectric-Tuned Microwave Cavity for Absorption Spectrometry. Filed Aug. 17, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,115,190. High Beta Plasma Operation in a Toroidal Plasma Producing Device. Filed Nov. 24, 1976. Patented Sept. 19, 1978. Not available NTIS.

Patent 4,118,042. Air Bearing Vacuum Seal Assembly. Filed Sept. 27, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,274. System for the Production of Plasma. Filed May 29, 1975. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,627. Guidance System for Laser Targets. Filed June 22, 1976. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,120,565. Prisms With Total Internal Reflection as Solar Reflectors. Filed June 16, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,120,710. Nitroaliphatic Difluoroformals. Filed Dec. 16, 1975. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,120,933. Decontamination of Plutonium From Water With Chitin. Filed Sept. 27, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,122,351. Automatic Targeting of Plasma Spray Gun. Filed Aug. 30, 1977. Patented Oct. 24, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 4,132,681. Fluorinated Polyether Network Polymers. Filed Oct. 29, 1976. Patented Jan. 2, 1979. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 28, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-8-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-18-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	10-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	6-21-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-19-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	4-10-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-12-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-7-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-31-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-21-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-25-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-9-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-16-78

Expiration of patents: The patents within the range of numbers indicated below expire during July 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,041,614 to 3,047,872, inclusive
Plant Patents..... Numbers 2,155 to 2,159, inclusive

REISSUES

OCTOBER 16, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

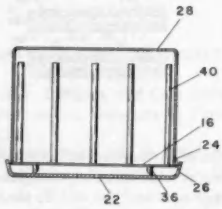
Re. 30,112
APPARATUS AND METHOD FOR CANNING FOOD

Ariel A. Andersen, Provo, Utah, assignor to Phillip V. Christensen, Provo, Utah, Trustee for the Foundation for Indian Development, Inc.

Original No. 3,973,480, dated Aug. 10, 1976, Ser. No. 469,544, May 13, 1974. Application for reissue Aug. 10, 1978, Ser. No. 932,886

Int. Cl.[2] **A23L** *3/10*

U.S. Cl. 99—359 **6 Claims**



1. An apparatus for canning food and the like comprising a platform with openings in the bottom thereof for receiving steam therethrough, frying pan means for receiving said platform therein; leg means on said platform for supporting it in spaced relationship with said frying pan means and cover means forming a chamber above said platform and detachably supported on said platform for receiving a container of food to be canned, and outlet means in the bottom portion of said chamber to permit air and steam to escape therefrom, said leg means comprising pipes secured to some of said openings and having sloped cut lower ends to permit condensed steam to be carried back to said pan means and other pipes secured to other openings in said pan extending upwardly into said cover means adjacent the top thereof for carrying steam therein.

Re. 30,113
WORKPIECE ELEVATOR

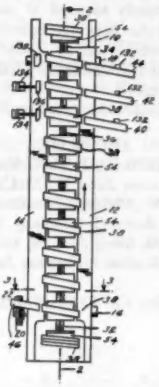
William F. Bell, Mt. Clemens, and Walter H. Van Deberg, Berkley, both of Mich., assignors to F. Jos. Lamb Company, Warren, Mich.

Original No. 3,938,649, dated Feb. 17, 1976, Ser. No. 528,287, Nov. 29, 1974. Application for reissue Feb. 28, 1977, Ser. No. 772,347

Int. Cl.[2] **B65G** *47/34*

U.S. Cl. 198—355 **13 Claims**

17. In a workpiece elevator the combination of a vertically extending support, endless chain means mounted on said support to travel in an endless path lying in a generally vertical plane, a plurality of workpiece carriers mounted on said chain means at regularly spaced intervals, said carriers having a workpiece supporting surface inclined to the horizontal and having an inlet at the upper end and an outlet at the lower end of said supporting surface, a workpiece inlet chute adjacent the lower end of the support and a series of regularly spaced outlet chutes adjacent the upper end of said support, the spacing of said outlet chutes corresponding to the spacing of the carriers on the endless chain means, means for driving said chain means in said endless path with an intermittent motion so that the inlets of successive carriers are periodically aligned with said inlet chute to receive workpieces therefrom and the outlets of the successive carriers are periodically aligned with the successive outlet chutes, workpiece control means mounted on each carrier adjacent the outlet thereof, said control means being movable from a first position blocking said outlet to prevent discharge of workpieces from the carrier to a second position clearing said outlet to permit workpieces to be discharged from the carrier by gravity, retaining means for releasably locking said control means in said first position as the carriers travel between the successive inlet and outlet chutes, release means on said support associated with each outlet chute for actuating said retaining means as the carrier moves into alignment with an outlet chute to unlock said control means and



cause the same to assume said second position clearing said outlet, at least some of said release means being movable to and from a position in which they are inoperative to actuate said retaining means and including means in said chutes responsive to the quantity of workpieces therein for moving said release means to and from said inoperative position.

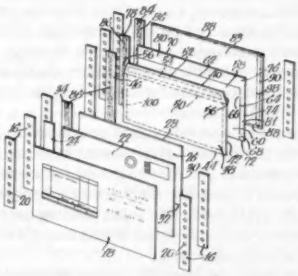
Re. 30,114
CONTINUOUS FORMS ASSEMBLY

Joseph J. Juszak, Crystal Lake, and Howard K. Absler, Skokie, both of Ill., assignors to Uarco Incorporated, Barrington, Ill.

Original No. 3,905,545, dated Sep. 16, 1975, Ser. No. 450,147, Mar. 11, 1974. Application for reissue Aug. 27, 1976, Ser. No. 718,389

Int. Cl.[2] **B65D** *27/10*

U.S. Cl. 206—610 **9 Claims**



1. In a continuous forms envelope assembly wherein a plurality of elongated, superimposed plies including transverse lines of weakening defining individual envelopes which may be separated from the assembly therealong and wherein upper

and lowermost ones of the plies define fronts and backs of envelopes with intermediate plies defining insert material within each envelope including at least a return envelope, the return envelope being defined by portions of adjacent intermediate plies, respectively defining the front and back of the return envelope, one of said adjacent plies further including an envelope flap that may be folded about and secured to the other of said adjacent plies of closing the return envelope and wherein the intermediate plies are constructed so that the insert material is free from the outer envelope along at least two, opposed, marginal edges of the outer envelope, the improvement wherein said other adjacent ply has an attaching portion secured to the outer envelope, said attaching portion being attached to a covering portion which is in substantial abutment with said flap; said attaching portion and said covering portion being loosely secured to the remainder of said other adjacent ply so that upon the opening of the outer envelope, the return envelope can be easily extracted with said attaching portion and said covering portion remaining interiorly of the outer envelope.

Re. 30,115

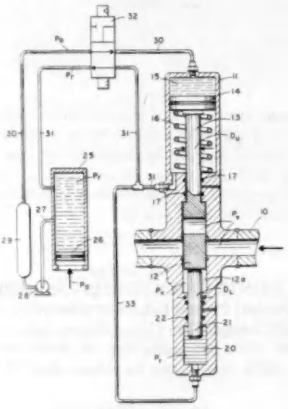
BALANCED STEM FAIL-SAFE VALVE SYSTEM

David P. Herd, Houston; John W. McCaskill, Tyler, both of Tex., and Thomas W. Childers, Mandeville, La., assignors to Exxon Production Research Company, Houston, Tex.

Original No. 3,933,338, dated Jan. 20, 1976, Ser. No. 516,704, Oct. 21, 1974. Application for reissue Jan. 19, 1978, Ser. No. 870,956

Int. Cl.[2] F16K *31/126*

U.S. Cl. 251—63.6 **24 Claims**



1. A hydraulically operable valve system for use in controlling flow of fluids through a submerged flowline comprising:

a valve housing arranged on said submerged flowline;

a valve chamber arranged in said valve housing;

a valve element movable in said valve chamber between open and closed positions for controlling the flow of fluids through said flowline;

first fluid pressure operable means connected to said valve element for urging said valve element from one to another of said positions of said valve element upon application of fluid pressure to said first fluid pressure operable means;

biasing means arranged in said valve housing for urging said valve element from said other to said one of said positions of said valve element; and

second fluid pressure operable means detached from and engagable with said valve element to urge said valve element toward said one position of said valve element upon application of same or about same fluid pressure applied to said first fluid pressure operable means to counterbalance the force applied to said valve element by means of said first pressure operable means.

Re. 30,116

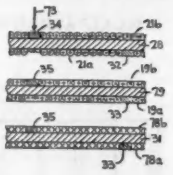
CARBONLESS MANIFOLD BUSINESS FORMS

George E. Maalouf, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Original No. 3,981,523, dated Sep. 21, 1976, Ser. No. 561,623, Mar. 24, 1975. Application for reissue Sep. 1, 1977, Ser. No. 829,826

Int. Cl.[2] B41M *5/22*

U.S. Cl. 282—27.5 **8 Claims**



1. A manifold set of carbonless recording sheets comprising:

a stack including at least three superimposed sheets;

the initially uppermost and the middle sheets each having a coating on their respective back surfaces and the initially lowermost sheet having a coating on its front surface;

the back coating of the middle sheet comprising, as a reactive component thereof, a first reactive component of a first initially colorless color forming reaction system *being in a transferable form such that the same will be transferred from said middle sheet to an adjacent sheet in response to the application of pressure thereto,* and the front coating of the initially lowermost sheet comprising, as a reactive component thereof, a second reactive component of said first reaction system;

the front coating of the initially lowermost sheet also comprising, as a reactive component thereof, a first reactive component of a second initially colorless color forming reaction system and the back coating of the initially uppermost sheet comprising, as a reactive component thereof, a second reactive component of said second reaction system,

one of the reactive components of the front coating of the initially lowermost sheet being in a transferable form such that the same will be transferred from said lowermost sheet to an adjacent sheet in response to application of pressure thereto and the other of the reactive components in the front coating of the initially lowermost sheet being in a non-transferable, record-receiving form,

said first and second components of the first reaction system being capable of interreacting to produce a colored mark upon coming into reactive contact,

said first and second components of the second reaction system likewise being capable of interreacting to produce a colored mark upon coming into reactive contact,

said first component of the first system and said second component of the *second* system being incapable of interreacting to produce a colored mark,

said first component of the second system and said second component of the first system being incapable of interreacting to produce a colored mark,

said middle sheet being initially disposed in overlying relationship to said lowermost sheet such that its back coating is disposed against said front coating of the lowermost sheet, whereby upon application of pressure to the stack, said back coating of the middle sheet and the front coating of the initially lowermost sheet are forced together to bring the first and second components of the first reaction system into said reactive contact to thereby produce a colored mark,

said sheets being capable of rearrangement such that said initially lowermost sheet overlies said initially uppermost sheet with the front coating of the initially lowermost sheet disposed against the back coating of the initially uppermost sheet, whereby upon application of pressure to the stack, said front coating of the initially lowermost sheet and the back coating of the initially uppermost sheet are forced together to bring the first and second components of the second reaction system into said reactive contact to thereby produce another colored mark.

Re. 30,117

IONIZATION-TYPE FIRE OR SMOKE SENSING SYSTEM

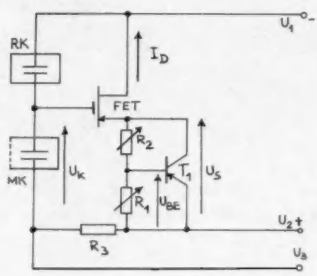
Andreas Scheidweiler, Uerikon, and Otto Meier, Hombrechtikon, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Original No. 4,037,106, dated Jul. 19, 1977, Ser. No. 699,333, Jun. 24, 1976. Application for reissue Feb. 13, 1978, Ser. No. 877,561

Claims priority, application Switzerland, Jul. 25, 1975, 9710/75

Int. Cl.[2] **G08C** *1/00*

U.S. Cl. 250—381 **9 Claims**



1. Ionization-type fire or smoke sensing system having
a source of electrical supply (U1, U2);
a measuring ionization chamber (MK);
a series resistance element (RK) connected in series with the measuring ionization chamber (MK);
a field effect transistor (FET) connected to the measuring ionization chamber, said FET having a conduction threshold voltage which is just above the level of the output voltage (U_k) of the measuring ionization chamber (MK) when smoke or fire aerosols are absent, so that, upon presence of smoke or fire aerosols, the output voltage of the chamber will rise and the FET will become conductive to provide an output signal;
and temperature control means (T1, R1, R2) to render the circuit combination of the ionization chamber (MK) and the FET essentially independent of temperature within a given range, comprising
a transistor (T1) having its collector-emitter path connected in the source supply path of the FET;
and a voltage divider (R1, R2) connected in parallel with the collector-emitter path of the transistor (T1), the tap point of the voltage divider being connected to the base of the transistor (T1);
to provide a temperature compensation characteristic which has the same relative control direction as the temperature characteristic of the measuring ionization chamber (MK) and dimensioned with respect to the FET to maintain [the conduction threshold thereof] *the difference of said output voltage (U_k) and of the voltage (U_s) at the source of said FET* essentially independent of temperature within said range.

Re. 30,118

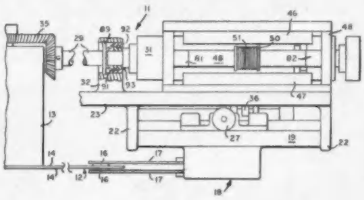
DISC DRIVE LINEAR ACTUATOR AND CONTROL SYSTEM THEREFOR

Martin O. Halfhill, San Jose, and Russell K. Brunner, Santa Clara, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Original No. 3,922,718, dated Nov. 25, 1975, Ser. No. 486,408, Jul. 8, 1974. Application for reissue Nov. 21, 1977, Ser. No. 853,662

Int. Cl.[2] **G11B** *21/08, 5/55*

U.S. Cl. 360—78 **30 Claims**



30. A disk drive comprising:
a support frame;
a magnetic recording disk mounted to said support frame for rotation about its axis;
at least one electromagnetic head mounted to a carriage and positionable relative to said magnetic recording disk by movement of said carriage along a predefined path; and
a linear actuator for selectively moving said carriage relative to said support frame along said predefined linear path, said linear actuator comprising a shaft having a cylindrical surface, means for rotatably mounting said shaft to a first predetermined one of said frame and said carriage for rotation of said shaft about a first axis, a roller, means for mounting said roller to a second predetermined one of said frame and said carriage with said roller being rotatable about a first axis and pivotable about a second axis perpendicular to said first axis, drive means coupled to a predetermined one of said shaft and said roller for rotating same about its first axis, means for mounting said carriage to said support frame with said carriage being movable relative to said support frame along said predefined linear path and with said roller being in frictional engagement with the cylindrical surface of said shaft, and means for controllably pivoting said roller about its second axis to control movement of said carriage along said predefined linear path during rotation of said shaft and said roller about their first axis.

Re. 30,119

COMPACT FOLLOW SPOT

Clyde L. Tichenor, Van Nuys, Calif., assignor to Berkey-Colortran, Inc., Burbank, Calif.

Original No. 3,900,726, dated Aug. 19, 1975, Ser. No. 464,133, Apr. 25, 1974. Application for reissue Nov. 11, 1976, Ser. No. 741,070

Int. Cl.[2] F21V *7/00*

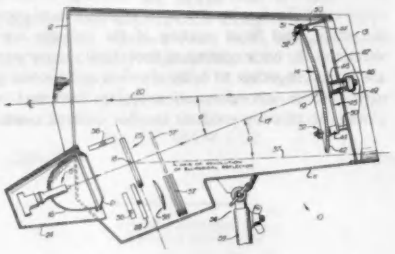
U.S. Cl. 362—1 32 Claims

1. A compact follow spotlight comprising:

a housing having one end that is optically transparent,

an elliptic mirror mounted within said housing near the other end thereof, the reflecting surface of said mirror comprising a [section] *segment* of an ellipsoid of revolution, said [section] *segment* being offset to one side of a meridian plane including the axis of revolution to said ellipsoid, and

a light source mounted within said housing near said one end remote from the near focus of said ellipsoid of revolution and offset to one side thereof so as to be substantially out of the path of light reflected from said mirror, said light source being arranged to project light past an object to be imaged placed at the near focus of said ellipsoid of revolution and toward said mirror, light from said source being reflected by said mirror through said transparent end and



focused by said elliptic mirror in a distant focal plane coinciding with the far focus of said ellipsoid of revolution.

PLANT PATENTS

GRANTED OCTOBER 16, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,464

FRUITLESS OLIVE TREE

Richard P. Wilson, 260 Cranston Crest, Escondido, Calif. 92025

Filed Aug. 3, 1978, Ser. No. 930,865

Int. Cl.[2] **A01H** *5/03*

U.S. Cl. Plt.—33 **1 Claim**

1. A new and distinct variety of olive tree as described and shown herein, characterized particularly by its more robust growth pattern, its thicker leaves and its fuller appearance, all as compared with the Manzanillo variety, and by its lack of fruit.

PATENTS

GRANTED OCT. 16, 1979

ERRATA

For CLASS	See PATENT NO.
042–065	4,170,837
123–198 A	4,170,960
414–687	4,171,054
414–412	4,171,055
226–064	4,171,068
435–188	4,171,244
548–235	4,171,307
585–487	4,171,329
525–180	4,171,330
525–437	4,171,422
250–445 T	4,171,476

PATENTS

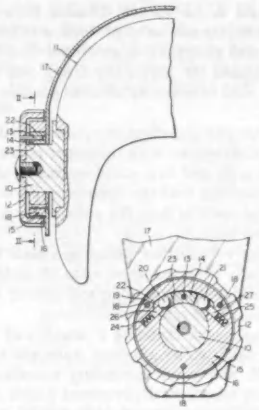
GRANTED OCTOBER 16, 1979

GENERAL AND MECHANICAL

4,170,792
POSITION LOCKING DEVICE FOR VISOR ON A HELMET

Victor W. Higgs, Staines, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 12, 1977, Ser. No. 824,112
Claims priority, application United Kingdom, Aug. 13, 1976, 33862/76
Int. Cl.[2] A42B *3/00*; A61F *9/04*
U.S. Cl. 2—10 **4 Claims**



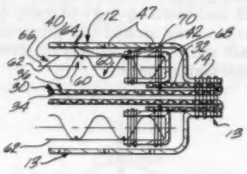
1. A visor and helmet assembly comprising an adjusting and locking device, the said device having a supporting boss attached to said helmet, and a clutch output member attached to said visor and rotatably mounted on said supporting boss, a clutch input member contained in a yoke formed on said clutch output member and two spring-loaded detent members also contained in the yoke one at each side of said clutch input member, said clutch output member yoke having walls tapering with respect to said supporting boss outward away from said clutch input member, said detent members operable normally to jam between the tapering walls and said supporting boss and to lock said clutch output member, and said clutch input member operable in either direction about said supporting boss to release said detent members and thereafter to drive said clutch output member and said visor to another position.

4,170,793
INNER GARMENT FOR AIDING EVAPORATIVE COOLING

Scott T. O'Brien, Arcadia, Calif., assignor to Safariland Ballistics, Inc., Monrovia, Calif.

Filed May 30, 1978, Ser. No. 910,295
Int. Cl.[2] A41B *9/06*
U.S. Cl. 2—113 **14 Claims**

1. An inner garment for aiding evaporative cooling comprising a first sheet of cloth having an inner face and an outer face and containing a substantial portion of cotton, the first sheet being adapted to be worn with its inner face next to the skin where it will act as a wick for perspiration, a second sheet in the form of a web having a major plane and being disposed adjacent the outer face of the first sheet, the web including a plurality of web filaments interwoven to leave openings with dimensions in the major plane substantially greater than the transverse dimensions of the filaments, and means for holding the web in a wrinkled condition with portions of the web filaments displaced out of the major plane of the web to give the web an effective thickness at least several times greater

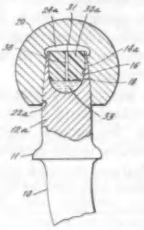


than the transverse dimensions of the web filaments to form a substantial air space between the first sheet and any outer garment worn over the inner garment.

4,170,794
BONE JOINT ENDOPROSTHESIS

Anton Zeibig, Ottensoos, Fed. Rep. of Germany, and John T. Scales, Stanmore, England, assignors to Rosenthal Technik AG, Bavaria, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,083
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **18 Claims**



1. A bone joint endoprosthesis, comprising:

a body of the bone joint; said body having a side and having a hole extending into said body from said side thereof; said body hole being defined in said body by a side wall;

a shaft for being received in a bone; said shaft having an end with a spigot defined thereon; said spigot being received in said body hole and being shaped to fit therein;

a spreader in said body hole; said spreader being comprised of a material that swells in the presence of a fluid; said spreader being placed such that as it swells, it applies clamping forces to hold said body of the joint securely to said spigot.

4,170,795
PORTABLE SHOWER

Shelton T. Hahn, 3141 S. Gary, Tulsa, Okla. 74105

Filed Jun. 19, 1978, Ser. No. 916,842
Int. Cl.[2] A47K *3/22, 3/23, 3/06*
U.S. Cl. 4—145 **3 Claims**

1. A portable shower comprising:

an open top vessel having a circumferential periphery defining an area of sufficient size to accommodate a bather thereunder, the vessel having an opening therein, the vessel, in cross-section, being formed of an inner dish-shaped, substantially flat bottomed portion, and an integral downwardly extending circular flange portion, the height of the circular flange portion being substantially

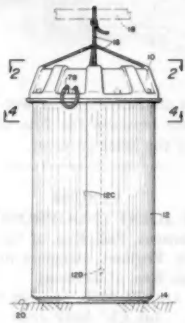
equal to or greater than the height of the inner dish-shaped portion, the lower, outer circumferential edge of said flange portion providing means for securing the upper edge of a shower curtain;

means of supporting said vessel in an elevated position;

means actuatable below the lower surface of said vessel of opening and closing said opening, said means including

a grommet of resilient material having an opening therethrough, the grommet being received in said opening in said vessel, said vessel having a plurality of small diameter openings spaced around said grommet,

a vertical shaft slidably and sealably received in said opening through said grommet,



and a flap of resilient material affixed to the upper end of said shaft, the dimensions of the flap being sufficient to cover all of said openings when said shaft member is pulled downwardly, closing said openings, and when said shaft is pushed upwardly, permitting water to flow through said openings,

and a shower curtain having an upper and a lower edge. the upper edge being attached to said vessel circumferential periphery whereby the shower curtain forms a tubular enclosure, and whereby water deposited in said open top vessel may be discharged through said opening to provide a shower for a bather surrounded by the shower curtain.

4,170,796

SWIMMING POOL WITH PROTECTIVE WALL

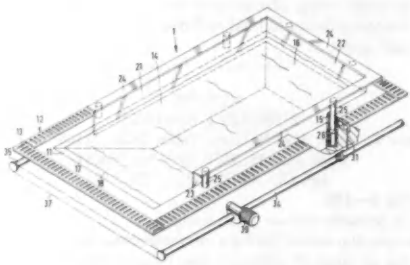
Klaus Schiron, Nelkenstrasse 2, 3100 Celle, and Hans F. Ruprath, Am goldenen Acker 35, 3001 Bennigsen, both of Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 812,810

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629856

Int. Cl.[2] E04H *3/18*

U.S. Cl. 4—172 **5 Claims**



1. A swimming pool suitable for selective use as a normal bathing pool and as a pool with wave operation, comprising:

two longitudinal fixed generally vertical walls, two transverse fixed generally vertical walls and a bottom fixed wall all joined together to form a fixed unitary open topped container for water and defining a swimming area having around its entire uppermost periphery a fixed overflow edge;

a continuous U-shaped rigid protective generally vertical wall at least partially surrounding the swimming area within the region of said two longitudinal walls and one of said tranverse walls, and having an uppermost peripheral edge;

means mounting said protective wall so as to be movable vertically between a lowered position with said peripheral edge being substantially no higher than said overflow edge, and a raised position with said peripheral edge being spaced above said overflow edge and above any other fixed swimming pool water confining structure;

said protective wall having a substantial vertical extent at least as great as the vertical distance between said positions so as to provide wave protection in said raised position from said peripheral edge to said overflow edge;

mechanical means for selectively lifting and lowering said protective wall between its lowered position and its raised position;

said protective wall including one plate extending along and generally coextensive with the upper portion of said one transverse wall, and two plates extending along and generally coextensive with the uppermost portion of said two longitudinal walls at least for a major length of said two longitudinal walls;

said protective wall further including a plate flange extending outwardly from the upper edge of each of said plates to define said peripheral edge and overlie said overflow edge in said lower position;

said mounting means including a plurality of cylinders embedded in said two longitudinal walls and said one transverse wall, and a corresponding plurality of columns respectively telescopically received within said cylinders, and having their uppermost ends rigidly secured to said plate flange.

4,170,797

APPARATUS FOR TREATING WASTE MATTER

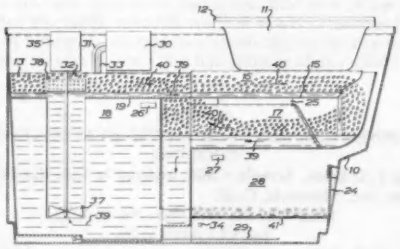
Hardy M. Sundberg, Industrivägen 3, S-437 00 Lindome, Sweden

Filed Jul. 22, 1977, Ser. No. 818,353

Claims priority, application Sweden, Jul. 23, 1976, 76083914

Int. Cl.[2] E03D *5/016, 9/10*; C02C *1/02*

U.S. Cl. 4—300 **9 Claims**



1. Aerobic digestion closet comprising a closet casing, a receptacle opening coverable by means of a lid, a receptacle compartment with receptacle means under said opening, a liquid container in communication with the receptacle compartment, and an aerobic digestion compartment, wherein a trituration pump is provided in said liquid container to circulate liquid in a path over said receptacle means for receiving and conveying material deposited on said means to said liquid container where said matter is triturated and dispersed,

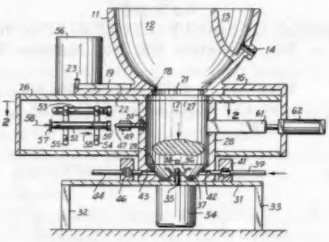
wherein a frother means is disposed in the circulation path of the liquid between said pump and said receptacle means, said frother means being arranged to convert a portion of the liquid to froth, wherein communication means supplies said froth at least to a certain extent to said aerobic digestion compartment, and wherein said receptacle means divides said receptacle compartment into an upper and lower compartment of which said upper compartment is, at its one end, connected to said pump by the intermediary of said frother means and, at its other end, is connected to the lower compartment of said receptacle compartment whereas the lower compartment is at its end opposite to the connection with the upper compartment, connected to the liquid container by the intermediary of a vertical channel.

4,170,798

APPARATUS FOR HOMOGENIZING AND HANDLING BIOWASTE AND OTHER MATERIALS IN ISOLATION

Carlos L. Krumdieck, Birmingham, Ala., assignor to University of Alabama in Birmingham, Birmingham, Ala.

Filed May 5, 1977, Ser. No. 794,147
Int. Cl.[2] G01N *1/04;* E03D *1/00*
U.S. Cl. 4—319 **5 Claims**



5. Apparatus for handling biowaste material in substantial isolation to limit the flow of odors from the material, the apparatus comprising:

a biowaste receiver comprising an upper section shaped like a toilet bowl tapering inwardly to a constricted opening, and a bulbous chamber below the opening and of greater diameter than the opening;

means near the uppermost part of the upper section to connect a source of homogenization fluid to direct the flow of that fluid down the interior wall of the upper section and into the chamber with the biowaste material;

sensor means to respond when the total quantity of solid material and homogenization fluid in the chamber reaches a certain level;

agitation means in the bulbous chamber to be automatically energized when the sensor responds and to agitate the solid material and fluid to form a substantially homogeneous mixture;

sampling mechanism comprising a turret to support a plurality of vacutainers adjacent the chamber;

an injection needle attached to the wall of the chamber at a lower level than the sensor and extending toward the sampling mechanism;

automatic stepping mechanism controlling the turret to feed one vacutainer at a time into engagement with the needle to receive an automatic injection of the mixture and then withdraw the vacutainer from the needle;

a second manifold located adjacent the first manifold and connected to a source of cleansing water; p1 an automatically controlled wash valve connected to the second manifold to control the flow of wash water through the second manifold and along the interior wall of the upper section of the bulbous chamber;

a third manifold extending around the upper section approximately midway between the first manifold and the constricted opening;

openings through the wall of the upper section and into the third manifold to allow air to flow from the lower part of the upper section into the third manifold;

a hood extending over each of the latter openings to prevent liquid from the first and second manifolds from entering the third manifold;

a liquid drain connected to the lowermost part of the bulbous chamber;

an automatic discharge valve connected to the drain;

an exhaust fan to draw air and odors out of the upper section through the third manifold;

a pump connected to the drain to remove liquid from the chamber and force it through the drain; and

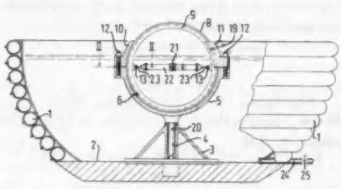
automatic sequencing means to control the operation of the controls.

4,170,799

SWIMMING APPARATUS

Johannes B. Ratelband, Utrechtsestraat 55-34, Arnhem, Netherlands (6811 LV)

Filed Oct. 26, 1977, Ser. No. 845,734
Claims priority, application Netherlands, Oct. 27, 1976, 7611925
Int. Cl.[2] A63B *69/12, 31/00*
U.S. Cl. 4—172 **12 Claims**



1. Apparatus for allowing a person to swim within a confined area, comprising in combination:

a basin adapted to be filled with water to a predetermined level; and

an upstanding support assembly fixed substantially centrally within said basin, said support assembly including first means engageable about a user's waist for allowing movement about a first axis passing transversely through the user's body, and second means pivotally mounting said first means about a fixed horizontal axis orthogonal to said first axis, said first means being positioned substantially at said predetermined level to allow the user freely to swim and third means mounting said second means for movement about a vertical axis, said first axis and said vertical axis being contained substantially in a common vertical plane.

4,170,800

SITDOWN PIECE OF FURNITURE CONVERTIBLE INTO A BED

Ole Wiberg, Vesterbrogade 180, Copenhagen Denmark

Filed Nov. 10, 1977, Ser. No. 850,388
Claims priority, application Austria, Nov. 16, 1976, 8527/76
Int. Cl.[2] A47C *17/16, 17/13*
U.S. Cl. 5—45 **10 Claims**

1. A piece of convertible furniture comprising:

a stationary frame adapted to stand on the floor in all operative positions of said piece of furniture and having an upper support surface with a front and a back;

a movable frame having at least one front leg ahead of said front in all operative positions of said piece of furniture and a back end supported on said support surface of said stationary frame in all operative positions of said piece of furniture, said movable frame being displaceable relative to said stationary frame between an out position with back

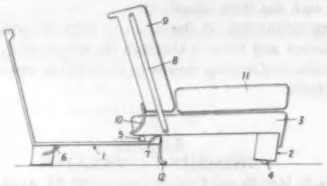
end supported at said front and said front leg remote from said front and standing on the floor and an in position with said back end at said back and said front leg at said front;

a seat cushion on said movable frame;

a backrest having a front side and a back side;

a back leg at said back side;

at least one arm pivoted on said displaceable frame and on said backrest, said backrest being pivotal on said arms



between a seat position generally erect at said back of said stationary frame and a bed position in front of said front leg of said stationary frame, generally coplanar with said seat cushion thereof, and with said back leg standing on the floor; and

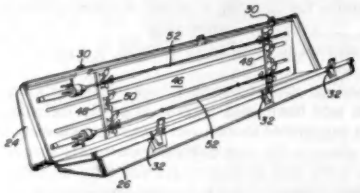
a loose cushion supported on said seat cushion in said seat and in positions and lying on said stationary frame behind said seat cushion in said bed and out positions.

4,170,801

FISHING ROD AND REEL BOX

Milton K. Ward, Monticello, Ark., assignor to DuraCraft Boats, Inc., Monticello, Ark.

Filed Nov. 23, 1977, Ser. No. 854,195
Int. Cl.[2] B63B *17/00*
U.S. Cl. 9—1.1 **2 Claims**



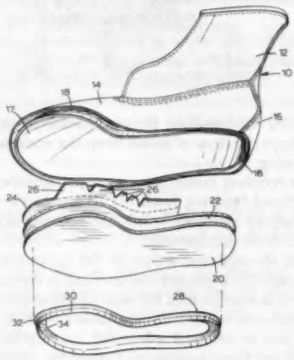
1. An elongated fishing rod and reel container and carrying case for removable mounting within a vehicle such as a boat defining horizontally spaced apart mounting surfaces, said case including first and second elongated housing sections opening toward each other and including a first pair of corresponding longitudinal side walls pivotally secured together for relative swinging between open and closed positions about an axis paralleling said side walls, clamp structures supported within one of said sections at points spaced longitudinally therealong for supporting assembled rod and reel assemblies within said case, a first of said sections including a longitudinal wall thereof remote from the other section having longitudinally spaced pairs of laterally spaced apart anchor means shiftably supported therefrom and provided with a manually operable first portion thereof within said first section and the second portions thereof disposed outwardly of said longitudinal wall of said first section, a pair of channel members including bight portions and for support from said mounting surfaces in relatively parallel relation and with said channel members opening toward said mounting surfaces, a pair of anchor members supported from each bight portion at points spaced therealong, said longitudinal wall of said first section including a plurality of transversely spaced longitudinal ribs, a pair of flat reinforcing bars overlying the outer surface of said one longitudinal wall of said first section at points spaced longitudinally therealong and with said bars extending transversely of said longitudinal wall of said first section and secured thereto, the opposite end portions of each of said reinforcing bars including first bores formed therethrough, the portions of said longitudinal wall of said first section aligned with said first bores having second bores formed therethrough, two pairs of grommets, each pair of grommets being secured through a corresponding pair of registered first and second bores, said anchor means including a shank portion rotatably received through each pair of registered first and second bores, said first portions of said anchor means being carried by the end portions of said shank portions projecting into said first case section and said second portions of said anchor means being carried by the opposite end portions of said shank portions projecting outwardly from the outer surface of said one longitudinal wall of said first section, each of said channel members having a pair of longitudinally spaced bores formed in its bight portion and said pair of anchor members supported therewithin in registry with said bight portion bores, said second portions of said anchor means projecting through said bight portion bores and being releasably engaged with said anchor members for removable support of said case from said channel members.

4,170,802

METHOD OF MANUFACTURING FOOTWEAR

Norman A. Roy, Waterville Hill Rd., Norridge Wock, Me. 04957

Filed Nov. 7, 1977, Ser. No. 849,346
Int. Cl.[2] A43D *9/00*; **A43C** *13/08*
U.S. Cl. 12—142 RS **9 Claims**



1. A method of manufacturing a footwear item, comprising the steps:

assembling an upper having a lower free edge with portions corresponding to the toe, the heel, and the inside and outside edges,

providing an insole having an underside and a top side,

bonding to the underside of the insole a length of prime rib tape which defines a rib, and margins on either side of the rib; the tape following the edge of the insole at least around the toe end and along both sides to the heel, and being set so that the rib is positioned at least about $\frac{3}{8}$" in from the insole edge,

stitching the tape in place along both margins thereof,

stitching said lower free edge to the rib,

roughening the lower free edge of the upper to allow cement to be impregnated thereinto,

applying cement to at least the roughened region,

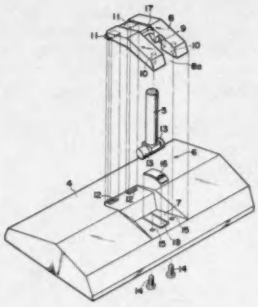
and molding an outsole against the underside of the insole so that the outsole contacts and bonds to the roughened region of the upper, whereby the upper is secured to the outsole by direct bonding while simultaneously being retained by stitching to said tape.

4,170,803

FLOOR SWEEPER HAVING A PIVOTABLE HANDLE

Gunsei Saito, Kashiwa, Japan, assignor to Hukuba Kogyo Kabushiki Kaisha, Chiba, Japan

Filed Feb. 6, 1978, Ser. No. 875,508
Claims priority, application Japan, Jan. 17, 1978, 53-3708[U]
Int. Cl.[2] A47L *13/11;* B25G *3/38*
U.S. Cl. 15—144 R 3 Claims



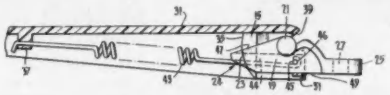
1. An improved pivot arrangement for a handle of a rotary floor sweeper comprising:
- a main body portion of said sweeper having a first concave portion in the center of the top thereof;
- a handle member and two shaft members at the base of said handle member projecting orthogonal to the axis of said handle member;
- holding member means removably fitted into said first concave portion of said main body and fitted around said shaft members on said handle for pivotally affixing said handle to said main body;
- said main body having a second concave portion beneath said handle member held in said first concave portion by said holding member means; and
- a leaf spring means removably fitted into said second concave portion and biased toward and engaging said handle member for tightly holding said handle member in said holding member means.

4,170,804

WIPER ARM AND MOUNTING HEAD

Douglas E. Scotcher, Elwood, Victoria, Australia, assignor to Vanauto Accessories Proprietary Limited, Port Melbourne, Australia

Filed May 15, 1978, Ser. No. 906,165
Int. Cl.[2] B60S *1/34*
U.S. Cl. 15—250.34 18 Claims



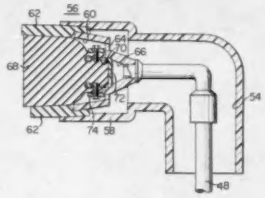
1. A wiper head attachable to a wiper arm,
- said wiper head having a boss and a finger,
- said wiper arm having a recess with an opening at one side thereof, and a shoulder;
- whereby said boss is insertable into said recess through said opening, whereafter said head is movable relative to said arm, by rotation of said boss in said recess, to a position locating said finger behind said shoulder,
- thereby preventing removal of said boss from said recess through said opening and thereby effecting said attachment.

4,170,805

WINDOW GLASS-CLEANING DEVICE

Moriji Kumagai, Kitakyushu, Japan, assignor to Yugen-Gaisha Waikei Giken, Kitakyushu, Japan

Filed Jun. 20, 1977, Ser. No. 808,356
Claims priority, application Japan, Jun. 21, 1976, 51-73478
Int. Cl.[2] A47L *11/38*
U.S. Cl. 15—321 5 Claims



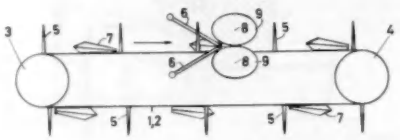
1. A device for cleaning window glass with a liquid comprising:
- an upright tank means having an open top and a closed bottom for containing said liquid therein;
- cover plate means over said open top for hermetically closing said top;
- exhaust means mounted on said cover plate means and communicating with the inside of said tank means for exhausting the air within said tank means therefrom, thereby creating at least a partial vacuum in said tank means;
- pumping means mounted on said cover plate means for pumping said liquid from said tank means;
- air filter means on said cover plate means between said exhaust means and the inside of said tank means for filtering the air exhausted from said tank means by said exhaust meand;
- a dirt percolator at the bottom of said tank in said liquid;
- a water suction hose extending from the inside of said dirt percolator to said pumping means;
- cleaning head means for pressing against said window glass and cleaning it;
- water feed hose means extending from said pump means to said cleaning head for providing water from said tank means to said cleaning head means; and
- a return hose means extending from said cleaning head means to said tank means above said liquid in said tank means for returning the water supplied to said cleaning head means to said tank means;
- said cleaning head means being comprised of:
  - an air-water suction tube connected to said return hose means at one end,
  - an elongated channel member connected to and communicated with said suction tube at the end thereof opposite the end connected to said return hose,
  - an air-water suction trough within and spaced from said channel member said trough having a central opening and a plurality of discrete openings through the bottom thereof,
  - a plurality of rubber plates between said channel member and said suction trough extending outward from said channel member,
  - a water supply tube connected to the bottom of said suction trough in communication with said central opening therethrough, said water supply tube being open at one end into said trough and connected to said water feed hose means,
  - a sponge member sandwiched between said rubber plates and projecting beyond the end of said channel member,
  - a sponge holder fitted into said open end of said water supply tube and having said sponge member fitted thereinto, and
  - sponge holder means connected to said trough for holding said sponge member in said sponge holder.

4,170,806

METHOD OF FIXING A FISH AS TO THE POSITION THEREOF IN A FISH PROCESSING MACHINE AND A MACHINE FOR PERFORMING SAID METHOD

Viktor E. Pettersson, Kullavik, Sweden, assignor to Arenco Aktiebolag, Vastra Frolunda, Sweden

Filed Jul. 29, 1977, Ser. No. 820,040
Claims priority, application Sweden, Aug. 5, 1976, 7608788
Int. Cl.[2] A22C *25/14*
U.S. Cl. 17—63 13 Claims



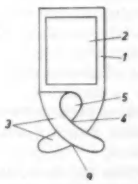
1. An apparatus for separating a fish head from the remainder of a fish, the apparatus comprising in combination, a cutting blade; a first conveyor movable in a predetermined path past the cutting blade; and means for fixing a position of a fish above the conveyor and relative to the cutting blade, said means comprising a tapered pin operatively connected to and extending upwardly from the first conveyor and having a free end protruding therefrom for insertion into the eye socket of a fish, the tapered pin gradually narrowing in the direction towards the free end, whereby the free end is inserted through the eye socket of the fish and the fish slides onto the tapered pin until the sockets fit closely with the tapered pin, whereby the fish is firmly positioned on the tapered pin irrespective of the size of the fish; and a second tapered pin, and wherein said first and second tapered pins are operatively connected to said first conveyor by means including pliers having two arms, each having a free end, each of which is connected to a respective one of the pins, two shafts each of which is connected to a respective one of the other ends of the arms, each arm being rotatable about its respective shaft, means connected to the shafts for rigidly connecting the arms by extending between portions of the arms intermediate the respective free ends and the other ends.

4,170,807

FASTENER MEANS

Lars Gustafsson, Leires vag 36, Lerum, Sweden (443 00), and Ulf G. Källqvist, Traststigen 4B, Mölnlycke, Sweden (435 00)

Filed Sep. 12, 1977, Ser. No. 832,735
Claims priority, application Sweden, Sep. 20, 1976, 7610383
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—137 R 7 Claims



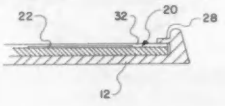
1. A fastening device to fasten and secure wash on a line comprising an upper section serving as a gripping portion adapted to extend in substantially parallel relation with the line and extending upwardly therefrom a sufficient distance to be gripped for insertion and removal and two resilient arms depending from said upper section, said arms being of uniform thickness and width and extending from respective opposite sides of a medial plane passing through said gripping portion of said upper section from one side of said medial plane to the other, said arms intersecting each other in a first plane perpendicular to said medial plane, at a point spaced from said upper section to define an aperture having a shape to accommodate the wash and line when said fastening device is secured thereover, said arms also intersecting each other in a second plane perpendicular to said first plane and parallel to said medial plane to exert a torsional force for securing the wash to the line through said arms.

4,170,808

BELT BUCKLE ASSEMBLY HAVING AN IMAGE FORMED ON A PHOTOSENSITIVE FACE PLATE THEREOF

Alfred E. Knowles, Raleigh, N.C., assignor to Harlan J. Rath, Savanna, Ill.

Filed Sep. 6, 1977, Ser. No. 830,573
Int. Cl.[2] A44B *11/00*
U.S. Cl. 24—163 K 6 Claims



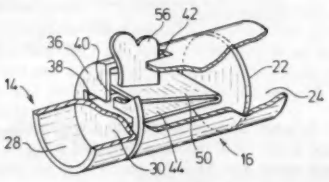
1. A belt buckle assembly having a photographic type image formed about a face portion thereof and comprising: a buckle blank having a back plate and connecting means for connecting said buckle blank to a flexible belt segment; an anodized photosensitive aluminum face secured to the back plate of said buckle blank; a photographic type image imprinted on said anodized photosensitive aluminum face; a sealed protective film layer disposed over said image and said aluminum face for providing a protective film about said image and said aluminum face; and wherein said buckle blank includes an upstanding perimeter edge and a pair of spaced apart face retaining means for retaining said aluminum face disposed within said buckle blank about opposite sides of said perimeter edge, each of said retaining means including a fixed and stationary projecting lip having an open area thereunder for receiving an edge portion of said aluminum face, whereby respective aluminum faces having different images developed thereon can be readily removed and inserted into said buckle blank.

4,170,809

AXIAL JEWELRY CLASP

Simon Geldwerth, and Mendek Rubin, both of Brooklyn, N.Y., assignors to Do-All Jewelry Mfg. Co., Inc., Brooklyn, N.Y.

Filed Jan. 18, 1978, Ser. No. 870,352
Int. Cl.[2] A44B *11/25*
U.S. Cl. 24—230 R 8 Claims



1. Releasably interlockable male and female clasp members for a jewelry band having slender terminals to which said clasp members conform and are respectively attachable, said male clasp member comprising:

a wall;

a detent projecting axially from one side of said wall;

a tongue forming part of said detent;

a leaf with a free end constituted by a distal extension thereof folded to overlie said tongue in a normal angular posture relative thereto but being resiliently deflectible to lie flatly against said tongue;

said female clasp member comprising:

peripheral walls defining a slender tubular body with an internal compartment within which said detent is receivable, and

a closure for said compartment having a narrow, elongated, slot straddling the compartment and extending substantially from one wall thereof to the opposite wall, said walls being mutually inclined progressively narrowing the compartment on one side, at least, of the said slot:

said detent being insertible into said compartment through said slot when the leaf is deflected to lie flatly against the tongue; said leaf being shorter than the tongue by the thickness of the compartment closure enabling it to pass wholly through the slot and being biased to recover its normal angular posture within the compartment; said tongue being generally the width of said slot and firmly ensconced therewithin and said leaf being generally the same width as said tongue end engaging the mutually inclined walls of the compartment under the bias aforesaid, inhibiting wobbling of the detent relative to the female clasp member; and

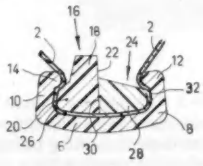
externally manipulable means being provided for deflecting the leaf in the interior of the compartment to flatten it against the tongue enabling withdrawal of the detent for the compartment through said slot.

4,170,810

FASTENING DEVICES FOR FLEXIBLE SHEETS

Alexander Peleg, Moshav Bitzaron, by Gdera, Israel

Filed Feb. 9, 1978, Ser. No. 876,555
Claims priority, application Israel, Feb. 17, 1977, 51474
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—243 K **9 Claims**



1. A device for securing a flexible sheet comprising

(a) a first substantially U-shaped channel member having a web portion and a pair of opposed legs each of said legs being provided with a lip, which lips are directed substantially towards each other;

(b) a second engaging member including a base and at least one depending arm, which member is adapted to engage one of the legs of said channel member with a generally flat back of the base of said engaging member facing the other leg of said channel member and the arm of said member disposed between said lip and said web; and

(c) a third bar-like clamping member having a width substantially corresponding to the distance between the back of the base of said engaging member, when engaging one leg of said channel member, and the opposite leg of said channel member and a height along at least one of its sides substantially corresponding to the height of said channel member as measured between said lip and said web, said bar-like member having a

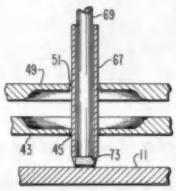
generally flat back wall section adapted to abut said back of said engaging member, and a curved corner adapted to engage the other leg of said channel member; said flat back portions when engaged being angled with respect to a central longitudinal plane normal to said web portion; the arrangement being such that upon the engagement of said engaging member with the leg of said channel member, with a flexible sheet passed therebetween and extending across said web and over said other leg, said clamping member is adapted to be first inserted with one of its sides positioned against one leg of said channel member between the lip and adjacent web of said leg and then to be frictionally rotated with the opposite side of said bar bearing against the back of said engaging member's base whereby the insertion of said bar-like clamping member is adapted to cause the arm of said engaging member to tightly clamp said sheet against said leg and the web adjacent thereto, while one side of said clamping bar is adapted to simultaneously clamp said sheet against at least the other leg of said channel member while the opposite side of said clamping member is firmly pressed against the back of said engaging member's base.

4,170,811

METHOD FOR COATING CATHODE MATERIAL ON CATHODE SUBSTRATE

John C. Turnbull, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,870
Int. Cl.[2] H01J *9/04, 9/12*
U.S. Cl. 29—25.16 **10 Claims**



1. In a method for making an electron gun for a vacuum electron tube having an electron emissive layer on a cathode substrate adjacent to an apertured grid, said grid having at least one beam-forming aperture therein, the steps comprising

(a) assembling said cathode substrate and said grid in predetermined fixed spatial relationship,

(b) providing an elongated support carrying cathode material at one end thereof,

(c) passing said one end through said aperture into close proximity with said substrate.

(d) transferring cathode material from said end to said substrate,

(e) and withdrawing said end from said assembly through said aperture.

4,170,812

METHOD OF MAKING A DUAL VALUE CAPACITOR

Glenn D. Rayno, Fairfield, Conn., assignor to Advance Transformer Co., Chicago, Ill.

Filed Sep. 14, 1977, Ser. No. 833,025
Int. Cl.[2] H01G *4/32, 4/38*
U.S. Cl. 29—25.42 **4 Claims**

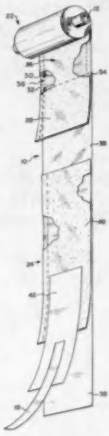
1. An improved method of making a dual value capacitor, including a core section formed by winding first and second metallized film strips one on top of the other into a cylindrical roll, each of said metallized film strips having a dielectric film layer having first and second outer edges and a first width and a metallized layer on one side of said dielectric film layer, said metallized layer having third and fourth outer edges and a second width less than said first width, said first outer edge of said dielectric film layer of said first metallized film strip being aligned with said third outer edge of said metallized layer of said first metallized film strip, said second outer edge of said dielectric film layer of said second metallized film strip being

aligned with said fourth outer edge of said metallized layer of said second metallized film strip, the improved method comprising:

terminating said first metallized film strip;

winding a dielectric film strip having a width substantially equal to said first width around at least a portion of said roll;

winding a strip of metal foil having a width less than said second width around at least a portion of said roll, aligned



such that neither edge of said metal foil is exposed at either edge of said roll;

terminating said second metallized film strip;

rotating said roll at least a portion of a revolution and terminating one of said dielectric film strip and said metal foil; and

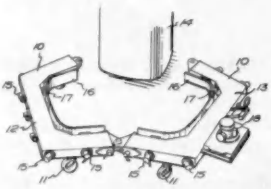
rotating said roll at least a portion of a revolution and terminating the other one of said dielectric film strip and said metal foil.

4,170,813

CLAMP FOR STRAPPING INGOT MOULDS

Robert A. Baird, Whitley Bay, and James E. Baird, Gosforth, both of England, assignors to J. O. & R. H. Baird Limited, Newcastle upon Tyne, England

Filed Nov. 26, 1976, Ser. No. 745,420
Int. Cl.[2] B23K *37/04*
U.S. Cl. 29—281.3 **2 Claims**



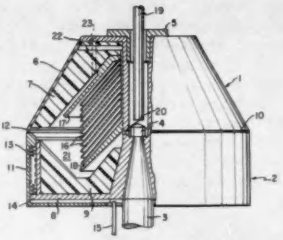
1. Apparatus for strapping ingot molds comprising a frame surrounding the base of a mold, the frame mounted on rotary means for rolling movement from place to place, and flexibly mounted hydraulic jacks or rams having plungers mounted on the frame for holding two or more non-pliable metal strap sections to the outer surface of said mold and for pressing the sections against said outer surface of said mold to lie around and conform to said outer surface in a pressure fit around said mold, and wherein each said flexibly mounted ram or jack has its end in the frame received in a cup shaped member, said end being convex, and a support plate having a semi-circular cut out located between the said end and the plunger end of said ram, the ram or jack being biased into said cut out by a spring and being further flexibly held in position by symmetrically arranged radial springs.

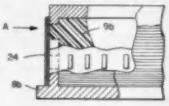
4,170,814

METHOD OF MANUFACTURING A CENTRIFUGE ROTOR

Martin Baram, Brondby Strand, Denmark, assignor to Reinebar AG, Zurich, Switzerland

Division of Ser. No. 523,753, Nov. 14, 1974, Pat. No. 3,997,106.
This application Apr. 2, 1976, Ser. No. 672,979
Claims priority, application Denmark, Nov. 20, 1973, 6250/73
Int. Cl.[2] B21D *39/00*
U.S. Cl. 29—452 **3 Claims**





1. A method of manufacturing a centrifuge rotor for use as part of a rotating centrifuge comprising taking a cover configured in the shape of an intermediate layer of said rotor and defining a plurality of perforations therein, winding an outermost layer in the form of wire material about the intermediate layer, rotating said cover while simultaneously pouring a relatively chemically resistant filler material in a liquid state into said cover at a predetermined speed and in such manner to cause a portion of the filler material to flow through the perforations defined by said intermediate layer and adhere to portions of the wire material forming said outermost layer, continuing said rotation of said cover until the filler material is at least partially solidified to form an inner layer of the centrifuge rotor, and finishing the surfaces of said outermost and innermost layers to form said rotor.

3. A method of manufacturing a centrifuge rotor for use as part of a rotating centrifuge comprising taking a metal cover having a predetermined configuration in the shape of an outermost layer of the rotor, preheating said metal cover, pouring a relatively chemically resistant filler material in a liquid state into said cover in a predetermined quantity less than the total quantity of said liquid filler material required, simultaneously rotating said cover in a given direction and at a predetermined rotational speed sufficient to place the cover in a stressed condition by outwardly directed bias forces which cause the filler material to compressively adhere to the inner surface of said cover while eliminating imperfections in the adhesion surface of said filler material, continuing said rotation of said cover in said given direction until the filler material is at least partially solidified to form an inner layer of said centrifuge rotor, continuing to pour intermittently, said liquid filler mate-

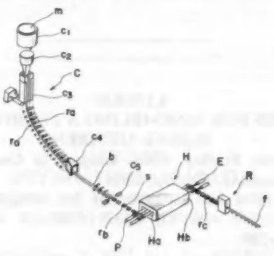
rial into said rotating cover in predetermined quantities less than the total quantity of liquid filler material required, each quantity being permitted to at least partially solidify before pouring the next quantity of said liquid filler material, reversing the rotation of said cover as it is associated with the pouring of each quantity of liquid filler material so as to obtain a plurality of layers of filler material with each layer being formed in relation to a cover rotation opposite to that of the next adjacent layer, cooling said metal cover sufficient to cause the metal to shrink in excess of the shrinkage of the filler material so as to create bias forces against the innermost filler material layer capable of off-setting at least a portion of the centrifugal forces to which said centrifuge rotor is subjected during normal operation as part of a centrifuge, and finishing the surfaces of said outermost and inner layers to form said rotor.

4,170,815

METHOD OF OPERATING A REHEATING FURNACE IN HOT ROLLING LINE

Tetsuya Tokitsu, Osaka, Japan, assignor to Chugairo Kogyo Kaisha Ltd., Osaka, Japan

Filed May 23, 1977, Ser. No. 799,312
Int. Cl.[2] B22D *11/128*
U.S. Cl. 29—527.7 **1 Claim**



1. A method of heating workpieces in a reheating furnace in a hot rolling line including a casting apparatus for casting workpieces to be rolled which is directly connected, through a heating means, to a rolling apparatus wherein the workpieces are subjected to rolling at a speed higher than they are produced by the casting apparatus, said method comprising the steps of:

providing a reheating furnace longitudinally divided into at least first and second heating zones in the direction of transportation of the workpieces through the furnace;

sequentially charging into one of said heating zones and longitudinally thereof a number of workpieces equivalent to the amount used for one operation of the rolling apparatus, said charging being at the speed at which the workpieces are delivered from the casting apparatus;

thereafter sequentially charging the other of said zones longitudinally thereof with further workpieces delivered from the casting apparatus at said speed;

keeping the group of workpieces in the one of said heating zones standing-by for a time sufficient necessary for the last charged workpiece in said one of said heating zones to reach the hot rolling temperature;

while continuing to charge the other of said heating zone with further workpieces, forwarding said group of workpieces in said one of said heating zones longitudinally to the rolling apparatus at a speed in synchronization with the rolling speed after the passage of a predetermined time;

charging the workpieces longitudinally into the other of said heating zones until an amount used for one operation of the rolling apparatus has been reached;

subsequently longitudinally charging said one of said heating zones again, at said speed, with workpieces successively delivered from the casting apparatus; and

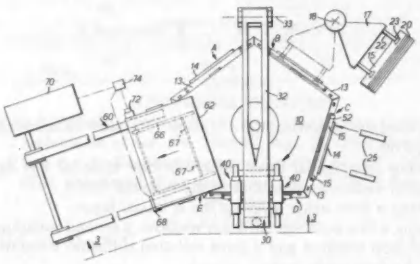
while charging said one of said heating zones again, forwarding the group of workpieces in said other of said heating zones longitudinally to the rolling apparatus at a speed in synchronization with the rolling speed after the passage of a further predetermined time.

4,170,816

CATHODE STARTING SHEET ASSEMBLY MACHINES

Thomas W. Garlick, 1 Sicilian House, Sicilian Ave., London, England (WCIA 2QD)

Filed Jan. 19, 1978, Ser. No. 870,648
Claims priority, application United Kingdom, Jan. 20, 1977, 2337/77
Int. Cl.[2] C25D *17/00*; B21J *15/00*; B23P *11/00*
U.S. Cl. 29—432.1 **16 Claims**



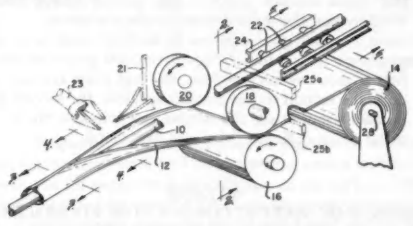
1. A cathode starting sheet assembly machine comprising a flat support table arranged to support a starting sheet substantially vertically, and means for shifting the support table successively through a sheet loading station, a loop-securing station and an assembled-sheet-removal station.

4,170,817

METHOD AND MEANS OF PACKAGING NUCLEAR FUEL RODS FOR HANDLING

Milton F. Adam, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 2, 1978, Ser. No. 902,184
Int. Cl.[2] G21F *9/28*
U.S. Cl. 29—450 **4 Claims**



1. An apparatus for encasing a slender cylindrical object in a metallic enclosing structure comprising:

(a) a coiled strip of an elastic metallic material that is formed into a overlapping cylindrical tube and then rolled into a coil under elastic stress such that upon release the elastic metallic material will resume a shape of an overlapping cylindrical tube;

(b) means for unrolling the rolled coiled strip to release the coil and permit the elastic metallic material to resume the shape of the overlapping cylindrical tube; and

(c) means for moving the slender cylindrical object into engagement with the releasing coil such that the elastic metallic material resumes substantially the shape of the

overlapping cylindrical tube while forming around an enclosing the slender cylindrical object,

whereby the slender cylindrical object is encased in the metallic enclosing structure.

4,170,818

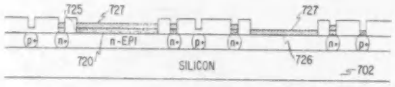
BARRIER HEIGHT VOLTAGE REFERENCE

Morley C. Tobey, Jr., Sunnyvale; David J. Giuliani, San Carlos, and Peter B. Ashkin, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 674,453, Apr. 7, 1976, Pat. No. 4,068,134, which is a continuation-in-part of Ser. No. 587,188, Jun. 16, 1975, Pat. No. 3,975,648. This application Oct. 3, 1977, Ser. No. 838,689

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **42 Claims**



1. A method of fabricating a voltage reference comprising the steps of:

growing an epitaxial layer on a substrate material having higher resistivity than that of the epitaxial layer;

growing a field oxide layer on the epitaxial layer;

opening a first isolation diffusion window, a second isolation diffusion window and a third isolation diffusion window in the field oxide layer;

forming isolation diffusions in the low resistivity epitaxial layer within each of the first, second and third isolation diffusion windows;

etching a first source window, a first drain window, a second source window and a second drain window in the field oxide layer;

forming source diffusions in the epitaxial layer within the first and second source windows and drain diffusions in the epitaxial layer within the first and second drain windows;

etching a first gate window in the field oxide layer;

etching a first source contact window, a first drain contact window, a second source contact window and a second drain contact window in the field oxide layer;

depositing a first metal on the epitaxial layer through the first gate window, the first source contact window, the first drain contact window, the second source contact window and the second drain contact window;

etching a second gate window in the field oxide layer; and

depositing a second metal through the first gate window, the first source contact window, the first drain contact window, the second source contact window, the second drain contact window and the second gate window, the second metal being different from said first metal.

4,170,819

METHOD OF MAKING CONDUCTIVE VIA HOLES IN PRINTED CIRCUIT BOARDS

Anthony E. Peter, Susquehanna, Pa.; Frank A. Shott, Vestal, and Robert L. Weiss, Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,468

Int. Cl.[2] H05K *1/04, 3/10*

U.S. Cl. 29—625 **4 Claims**

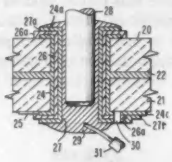
1. In a multilayer printed circuit board having a plurality of through via holes therein, a method for making via holes having inherent change capability for connection to a desired change point, comprising:

forming the via holes in said printed circuit board;

depositing a conductive metal in said via holes to provide predetermined interconnections between at least one internal plane and circuit patterns on one or both surfaces of said printed circuit board;

depositing a coating of insulating material to overlay all but a portion of said conductive metal in said via holes; and

depositing a second conductive metal to overlay all of said insulating material in said via holes and to contact the exposed portion of said first conductive metal on at least one of the surfaces of said printed circuit board;



making a cut through said layers of first and second conductive metals and insulation material at some point between the via hole and the interconnection between said first and second conductive metals and subsequently connecting the via hole to a desired change point, whereby changes can be made to a selected via hole in said structure.

4,170,820

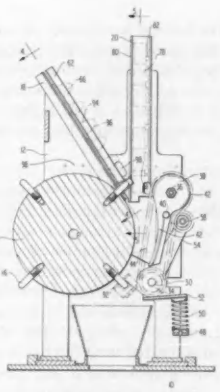
APPARATUS FOR ASSEMBLING A FERRULE WITH A SLEEVE MEMBER

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire and Rubber Company, Findlay, Ohio

Filed Jan. 13, 1978, Ser. No. 869,278

Int. Cl.[2] B23P *19/02*

U.S. Cl. 29—789 **11 Claims**

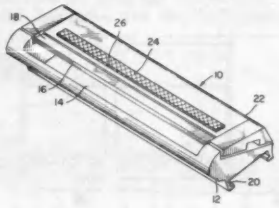


1. An apparatus for assembling an insert with a sleeve member comprising a plate member having a rotatable member mounted thereon, a plate having a cam track thereon mounted on said plate member, supply chutes for said insert and said sleeve member mounted on said plate member with the discharge ends thereof positioned between said rotatable member and plate, driving means for said rotatable member, means on said rotatable member engagable with said supply chutes for removing therefrom said insert and sleeve member in partially assembled relation and moving said insert and sleeve member into engagement with said cam track for camming said sleeve member and insert together.

4,170,821
RAZOR CARTRIDGES

Anthony R. Booth, Orange, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 2, 1977, Ser. No. 856,887
Int. Cl.[2] B26B *21/44*
U.S. Cl. 30—41 15 Claims

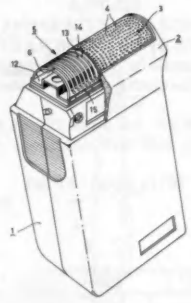


1. A disposable razor cartridge comprising:
a blade seat;
a razor blade;
a cap; and
an integral solid shaving aid, said shaving aid being permanently and substantially immovably affixed to said cartridge and being water soluble.

4,170,822
DRY SHAVING APPARATUS

Gerrit J. Groothuis, and Tjamme de Vries, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,037
Claims priority, application Netherlands, Dec. 1, 1976, 7613355
Int. Cl.[2] B26B *19/04*
U.S. Cl. 30—43.92 3 Claims



1. A dry-shaving apparatus, which comprises a shear foil having hair entrance apertures, a cutting member movable relative to the shear foil and including a holder and a flexible cutter plate formed with two oppositely disposed edge portions, means provided in each edge portion for fixation of the cutter plate to the holder, lamellar cutting elements extending from edge portion to edge portion of the cutter plate, slots in the cutter plate separating the lamellar cutting elements, and a single row of openings in each edge portion of the cutter plate so arranged that an opening is situated opposite each lamellar cutting element, said row being spaced from the slots.

4,170,823
FLUORESCENT ARTIFICIAL TEETH

Milagros B. Smyth, East Brunswick, and James Lee-You, Cranbury, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

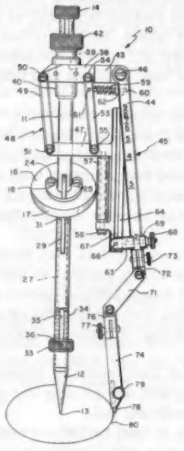
Continuation-in-part of Ser. No. 763,450, Jan. 27, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 877,588
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—8 3 Claims

1. An artificial porcelain tooth product containing from 0.05 percent to 2.5 percent by weight of terbium oxide and from 0.01 percent to 1.0 percent by weight of cerium oxide and provided that when the cerium oxide is from 0.01 percent to 0.04 percent by weight, the terbium oxide is at least 0.1 percent by weight and when the terbium oxide is from 0.05 to 0.1 percent by weight, the cerium oxide is at least 0.04 percent by weight whereby said tooth product has fluorescent properties comparable to those of natural teeth.

4,170,824
UNIVERSAL COMPASS

Tom T. Mikulin, 1469 Bellevue Ave., Burlingame, Calif. 94010

Continuation of Ser. No. 726,949, Sep. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 672,297, Mar. 31, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 845,894
Int. Cl.[2] B43L *11/04*
U.S. Cl. 33—30 C 7 Claims

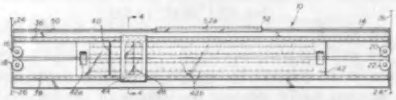


7. A compass for drawing geometric figures on a surface, including the combination of an upstanding center post having a lower end for supporting the compass on the surface, a head member mounted for rotation about the longitudinal axis of the post, a writing arm mounted at its upper end on the head member for pivotal movement about a horizontal axis, said writing arm carrying a marking element, a cam disc mounted on the post, means for orienting the disc at a selected attitude with respect to the post, a circular cam follower concentric with the disc and mounted for rotation about the axis of the disc, a carrier mounted for rotation with the head member and for radial movement relative to the post, means for connecting a medial portion of the writing arm with the carrier, means for connecting the carrier for movement with the cam follower whereby rotation of the cam follower about the disc causes the carrier to move the writing arm in a predetermined path about the post.

4,170,825
SCALING PARALLEL BAR

Dudley W. Russell, 12307 Vanderheath, Houston, Tex. 77031

Filed Jan. 16, 1978, Ser. No. 869,516
Int. Cl.[2] B43I *13/02*
U.S. Cl. 33—444 10 Claims



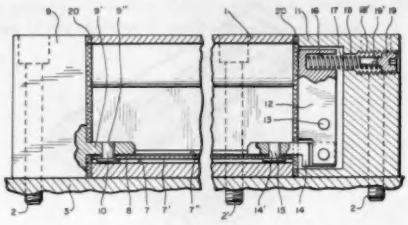
1. A parallel bar for use with a planar working surface comprising:
(a) an elongate base;
(b) guide means, for constraining said base to translational motion along a direction on said surface, said direction generally perpendicular to the longitudinal axis of said base means, said guide means including:
(i) a first pair of sheaves mounted on said base means toward one end thereof;
(ii) a second pair of sheaves mounted on said base means toward a second end thereof;
(iii) flexible line means including a first line segment passing around one sheave of said first pair of sheaves, along said base and around one sheave of said second pair of sheaves, and a second line segment passing around the other sheave of said first pair of sheaves, along said base and around the other sheave of said second pair of sheaves; and
(iv) anchor means for anchoring said flexible line means relative to said surface whereby, as said base is selectively moved along said direction in either sense thereof, said first and second line segments move generally along said base, between said first and second pairs of sheaves;
(c) first way means, as part of said base;
(d) indicator means constrained to movement relative to said base along said first way means, and connected to one of said first or second line segments with which said indicator means moves along said base, and between said first and second pair of sheaves, as said base is moved along said direction in either sense thereof;
(e) second way means and third way means, each as part of said base and generally parallel to said first way means, said second way means being disposed generally between said first and third way means, and on a plane above said first and second pair of sheaves relative to said working surface;
(f) scale means, at least partially transparent, selectively moveable along said second way means, and selectively removeable therefrom; and
(g) carriage means, at least partially transparent, and including reference means, and selectively moveable along said third way means.

4,170,826
LONGITUDINAL MEASURING DEVICE WITH LONGITUDINALLY DISPLACEABLE SCALE

Siegbert Holstein, Stein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,790
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712421
Int. Cl.[2] G01B *11/04*
U.S. Cl. 33—125 C 15 Claims

1. In an encapsulated longitudinal measuring device including a flexible measuring scale defining first and second end sections and extending along a longitudinal direction, a tubular member surrounding at least a portion of the measuring scale and secured to a first object, and a scanning unit guided along the scale by the tubular member and coupled to a second object relatively moveable with respect to the first object, the improvement comprising:
means for securing the first and second end sections of the measuring scale directly to the first object; and

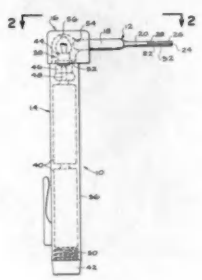


means, included in the tubular member, for embracing the measuring scale inside the tubular member in a longitudinally displaceable manner, said embracing means operative to restrict lateral movement of the scale substantially without applying distorting or clamping forces thereto such that the scale is moveable longitudinally in the embracing means.

4,170,827
APPARATUS FOR MEASURING HAIR GROWTH

Maurice Katz, No. 7 Avenue Marina, Bantry Bay, and Kenneth E. Wheeler, 44 Upper Rhine Rd., Sea Point, both of South Africa (8001)

Filed Dec. 7, 1977, Ser. No. 858,381
Int. Cl.[2] G01B *5/02*
U.S. Cl. 33—125 R 7 Claims



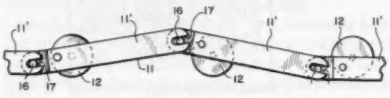
1. A device for measuring hair length, which comprises in combination:
a transparent tubular member having an axial passageway and an open end adapted to receive a hair whose length is to be measured and to maintain the hair in an extended condition;
graduations on said member corresponding to the length of said member from the open end; and
means supporting said tubular member and for projecting light into it to facilitate visual comparison of the longitudinal extent of the hair with said graduations.

4,170,828

ERROR CORRECTION APPARATUS FOR LONGITUDINAL MEASURING INSTRUMENT

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,662
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724858
Int. Cl.[2] G01B 5/04, 11/04
U.S. Cl. 33—125 R 11 Claims



1. In a measuring instrument including a measuring scale, a scanning unit adapted to move along the scale, and means for coupling the scanning unit to an object whose position is to be measured, wherein said coupling means is operative to permit relative movement between the scanning unit and the object in the direction of the scale, an error compensation apparatus comprising:

a plurality of correction members linked to form a correction profile extending substantially in the direction of the scale;

adjustment means for adjusting the position of at least a portion of the correction members transverse to the direction of the scale;

measuring means for sensing the position of the correction profile transverse to the direction of the scale; and

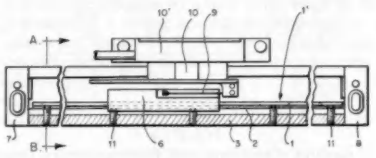
positioning means responsive to the measuring means for positioning the scanning unit with respect to the object in the direction of the scale such that the separation therebetween in the direction of the scale corresponds in a predetermined manner with the measured position of the correction profile.

4,170,829

CORRECTION APPARATUS FOR LONGITUDINAL OR ANGULAR MEASURING SYSTEM

Gunther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,909
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735154
Int. Cl.[2] G01B 11/04
U.S. Cl. 33—125 R 12 Claims



1. In a measuring device including a measuring scale having spaced graduations and a scanning unit movable along the scale, an error correction apparatus comprising:

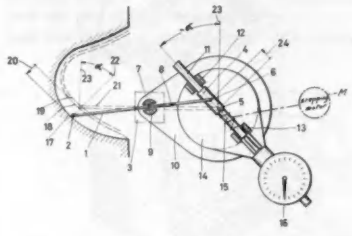
means for deflecting the measuring scale at one or more points along the scale such that the graduations do not lie in a single plane, said deflecting means operating to alter the effective spacing of the graduations to accomplish the error correction.

4,170,830

FEELER FOR MEASURING LENGTHS

Karl-Heinz Weber, Hückeswagen, Fed. Rep. of Germany, assignor to W. Ferd. Klingelnberg Sohne, Remscheid, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,946
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1977, 2701377
Int. Cl.[2] G01B 5/20, 7/28
U.S. Cl. 33—174 P 8 Claims



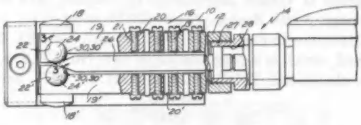
1. A feeler for measuring lengths with controlled measuring direction which includes: a feeler lever movable from a zero position representing its non-deviated position into a plurality of positions deviating therefrom, said feeler lever having a first end and a second end, said first end forming a substantially circular feeler tip for feeling engagement with the workpiece to be measured, a base plate, a bi-valent joint carried by said base plate and permitting a displacement of said first end in the measuring plane in any desired direction, a disc rotatably mounted on said base plate and rotatable about an axis perpendicular to said measuring plane, straight line guiding means mounted on said disc including a longitudinally movable member, said member having linked thereto said second end of said feeler lever at a linkage point, thrust means acting upon the movable member in the longitudinal direction of said straight line guiding means and upon the movable member, and displacement sensing means connected to said disc for measuring the longitudinal displacement of said linkage point.

4,170,831

BORE GAGE

Joseph S. Olasz, North Kingstown, R.I., assignor to Federal Products Corporation, Providence, R.I.

Filed Jun. 21, 1978, Ser. No. 917,640
Int. Cl.[2] G01B 5/12
U.S. Cl. 33—178 R 5 Claims

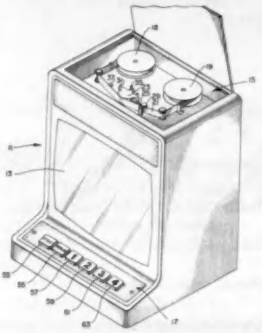


1. A bore gage comprising a tubular casing having a diametrically extending transverse opening adjacent one end thereof, movable contact elements slidably received in opposite ends of said opening and having outer surfaces to engage the bore to be measured, a longitudinal member axially slidable in said casing, one end of said longitudinal member provided with a pair of V shaped grooves each having faces with cylindrical segments of a single circle whose axis passes through the axis of the longitudinal member, said contact elements engaging the cylindrical segments with a curved surface having a diameter equal to the diameter of the circle defined by the segments on the faces of the V shaped grooves.

4,170,832
INTERACTIVE TEACHING MACHINE

Kurt E. Zimmerman, 13265 Edinburgh Dr., Westminster, Calif. 92683

Filed Jun. 14, 1976, Ser. No. 695,491
Int. Cl.[2] G09B 7/08
U.S. Cl. 35—9 A 16 Claims



1. An audiovisual teaching apparatus comprising:
motion video projection means;
a stored motion video program, said program including:
a first motion video life-like scene program segment including an introductory scene leading to a decision;
a second program segment identifying alternative choices of action based on said first program segment;
means identifying the end of said second program segment;
multiple third motion video life-like scene program segments each including scenes depicting the likely result of one of said alternative choices of action; and
means identifying the end of said third program segments;
apparatus for inputting said stored motion video program into said motion video projection means;
a switch for initiating operation of said inputting apparatus;
means automatically interrupting said inputting means in response to said means identifying the end of said second segment;
switch means for selecting one of said multiple third program segments; and
means responsive to said switch means for sequencing said inputting means to a selected one of said multiple third program segments.

4,170,833
CALLIGRAPHIC ALPHABET LETTERING KIT

Cassandrasu D. Quinn, and Marcel O. Vachon, both of 499 E. Broadway, South Boston, Mass. 02127

Continuation-in-part of Ser. No. 750,267, Dec. 13, 1976, abandoned, which is a continuation of Ser. No. 637,876, Dec. 5, 1975, abandoned. This application Oct. 19, 1977, Ser. No. 843,660
Int. Cl.[2] G09B 11/04
U.S. Cl. 35—36 4 Claims

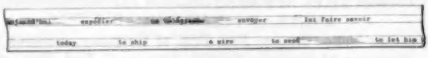
1. A method of teaching and/or mechanically effecting the art of pen calligraphy in multiple calligraphic alphabets, and alphabet-pen nib-pen angle combinations by artists of limited schooling and/or experience and/or talent comprising,
(a) providing for each of multiple calligraphic alphabets and combinations of such alphabet with pen nib and pen angle combinations, a two dimensional layout of the alphabet in running linear array and overlaid with means defining ascender, head, descender, air, and base guidelines which are spaced from each other in selected numbers of integral increments of one pen nib width of a pen held at a given angle,
(b) further providing for each such layout similar guide spacing in equal integral number increments of different nib widths.
(c) establishing in erasable form at least one writing assisting array of guidelines on a writing surface by use of one of said guides, the head, ascender, descender, air and base guidelines using the spacings of said guide,
(d) erasably ruling in parallel form on said surface guidelines

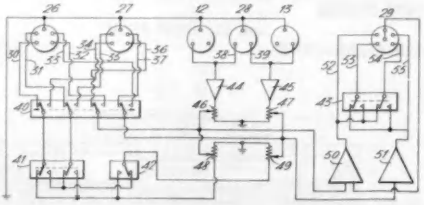
spaced according to said guide, selecting a pen with nib width and angle, corresponding to said guide and said two dimensional layout and using the pen to letter a linear array of letters on said writing surface over said erasable guidelines scaling from said two dimensional layout, and
(e) wherein the parts of each letter are stroked essentially in the same sequence of line pen angle direction as in the layout.

4,170,834
METHOD AND DEVICE FOR FOREIGN LANGUAGE LEARNING AND TEACHING BY MEANS OF RECORDINGS

Ian R. Smart, 10, Avenue Frémiet, 75016 Paris, France

Continuation of Ser. No. 643,564, Dec. 22, 1975, abandoned. This application Apr. 6, 1977, Ser. No. 785,278
Claims priority, application France, Dec. 24, 1974, 74 42754
Int. Cl.[2] G09B 5/04, 19/06
U.S. Cl. 35—35 C 4 Claims





1. A method of teaching and learning foreign languages by means of recorded materials for use by at least a first and a second learner wherein learners are instructed to produce a succession of linguistic performances in response to a succession of recorded stimuli considered together with a related succession of spoken stimuli supplied by the learners themselves including the steps of:
(a) arranging at least a first and a second learner constituting a learner pair in conversational relation to each other;
(b) aurally communicating respectively to the first and sec-

ond learners a first and a second stimulus, said first and second stimulus being recorded in said recorded materials and being communicated to said first and second learners by means of a single earphone per learner, said first and second stimuli being different from each other, said first stimulus being communicated exclusively to said first learner of each learner pair, said second stimulus being communicated exclusively to said second learner of each learner pair;

(c) aurally communicating to the second learner a third spoken stimulus, said third stimulus being communicated verbally to said second learner by said first learner in response to said first recorded stimulus;

(d) aurally communicating to the first learner a fourth spoken stimulus, said fourth spoken stimulus being communicated verbally to said first learner by said second learner in response to both said second recorded stimulus and said third spoken stimulus;

(e) repeating steps (b), (c) and (d) whereby a conversation between the first and second learner under control of said recorded material is maintained.

3. An apparatus for the teaching and learning of foreign languages for use by at least two learners constituting a learner pair wherein each of said learners receives recorded verbal cues transmitted from a record medium and wherein at least one learner of said learner pair also receives spoken cues received from the other learner and wherein at least one learner is instructed to produce a succession of linguistic performances in response to the combination of said recorded and spoken cues considered together including:

(a) a record medium having at least a first and a second channel;

(b) means for transmitting information contained on said first channel exclusively to said first learner of each learner pair;

(c) means for transmitting information contained on said second channel exclusively to said second learner of each learner pair;

(d) said information contained on said first channel being arranged to include a continuing sequence of verbal cues and a corresponding continuing sequence of responses arranged in the following sequence:

a first verbal cue;

a correct response to said first verbal cue;

the correct response being delayed in respect to said first verbal cue by a time delay equal to the reaction time of a native speaker for responding to said first verbal cue;

(e) said information contained a said second channel being arranged to include a continuing sequence of verbal cues and responses arranged in the following sequence:

a second partial verbal cue;

a second correct response to said second verbal cue considered together with a third spoken verbal cue communicated to the second learner by the first learner;

said second correct response to said second recorded verbal cue considered together with said third spoken verbal cue being delayed with respect to said second and third verbal cues by a time delay equal to the reaction time of a native speaker for responding to said second and third verbal cues, with said time delay being uniquely dependent upon said second and third verbal cues.

4,170,835
IRON WITH MODE VALVE

Benjamin H. Bain, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,354
Int. Cl.[2] D06F *75/06*
U.S. Cl. 38—77.5 **5 Claims**

1. In an electric flatiron with plural surge and spray functions, a water tank, steam generating soleplate with ports for distributing normal steam and/or extra surge steam on demand, a handle with spray means and a pump connected to said tank with a button on said handle for manual pump actuation to deliver water to the soleplate surge or handle spray means as directed by a separate handle-mounted mode selector valve subassembly, an improvement in said mode valve comprising,

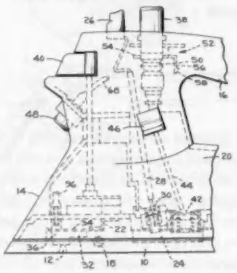
a molded cup-shaped valve housing with an upright closed peripheral side wall with spaced stops,

said side wall enclosing a flat bottom wall and all mounted within said handle,

a plurality of outlets through the bottom wall,

an integral flexible seal including a cup-shaped disc with molded integral tubes extending through said outlets to seat the disc in said housing,

said disc having separate annular walls around each outlet



protruding into said housing cup forming a chamber therein,

a flat gate with an actuating arm through the iron handle,

said gate having a projection rotatably nesting snugly in the cup housing to seal against the protruding walls,

an arcuate channel in said projection connecting only two outlets,

means clamping and compressing said gate and disc together,

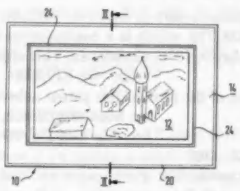
said gate having peripheral stops to abut said spaced stops,

whereby said actuating arm external of the handle is rotatable against said stops to selectively direct water to the spray and extra surge functions on separate pump actuation.

4,170,836
PICTURE FRAME MAT

Ludwig Seufert, Sonnleite 33, 8702 Lengfeld, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,317
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 7713250[U]
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—158 R **2 Claims**



1. A picture frame comprising a plastic sheet having a surface bearing a graphic presentation and further comprising a picture carrier comprising first and second interconnected plastic layers and a reinforcing insert sandwiched therebetween;

wherein the first and second plastic layers are welded to-

gether at least at the edges and whereby a closed framing strip is impressed in the first plastic layer;

wherein said plastic sheet bearing the graphic presentation is affixed to the first plastic layer inside the impressed framing strip;

and wherein an additional plastic insert is arranged between said first plastic layer and said reinforcing insert such that said plastic insert is outside the area of the plastic sheet bearing the graphic presentation.

4,170,837

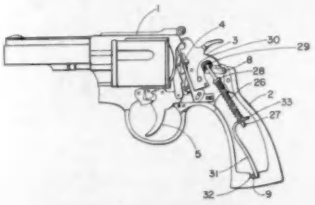
HAMMER ACTION OF A REVOLVER

Leon Smith, P.O. Box 773, Redding, Calif. 96001

Filed Apr. 5, 1978, Ser. No. 893,253

Int. Cl.[2] F41C *1/00*

U.S. Cl. 42—65 **2 Claims**



1. An improved mechanism for actuating a hammer of a revolver positioned within a handle frame thereof comprising:

a helical spring;

a plunger having one ball-shaped end positioned for slidable axial motion concentrically within said spring;

a collar positioned on said plunger adjacent said ball-shaped end disposed to engage the first end of said spring;

an angle bracket;

the first end of said bracket having a hole therethrough disposed to loosely engage said plunger;

said first end of said bracket being further disposed to engage the second end of said spring;

the second end of said bracket being disposed to pivotally engage the bottom of said handle frame;

said pivotal engagement being further disposed to permit rotation of said bracket about said pivot in the plane of said spring;

said ball-shaped end of said plunger being disposed to engage a socket in the hammer of said revolver;

whereby backward motion of said hammer produces a combined motion of compression and lateral flexing of said helical spring.

4,170,838

LICENSE PLATE FRAME ASSEMBLY

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 718,941, Aug. 30, 1976, Pat. No. 4,038,770, which is a continuation-in-part of Ser. No. 683,421, May 5, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,850

The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

Int. Cl.[2] G09F *7/00*

U.S. Cl. 40—209 **4 Claims**

1. In combination a one-piece molded plastic license plate frame adapted for cooperation with a license plate having a width dimension of approximately twice its height dimension and having a pair of spaced apart fastener receiving openings formed adjacent one horizontally extending edge thereof, and a support bracket,

said support bracket being of a generally rectangular shape and having spaced vertically extending rolled edges defining recesses for receiving vertical extending edge portions of said plate, openings adapted to be aligned with said openings formed in said plate, and means for securing said support bracket to a portion of a motor vehicle,

said frame being of a generally rectangular shape and comprising upper and lower horizontally extending sections and vertically disposed end sections extending between and integrally connected to the opposite ends of said horizontal sections,

each of said frame sections comprising an outer enclosure wall portion arranged at substantially right angles to the plane of said license plate, and an integral frontal wall portion that extends substantially parallel to the plane of the license plate and inwardly from the forwardmost part of the associated outer enclosure wall portion,

said outer enclosure wall portions and said frontal wall portions of said vertical end sections cooperating to conceal said rolled edge portions of said support bracket;

said frontal wall portions providing an unobstructed rectangular opening having linear side edges through which the forward face of the license plate may be viewed,

said frontal wall portions overlying the outer marginal edge portions of the forward face of said license plate and defining inwardly and rearwardly beveled face portions adjacent said opening and a decorative face area,

said decorative face areas including a pair of spaced parallel forwardly projecting ribs between which is located an intermediate recessed surface area provided with an appearance enhancing treatment, said ribs protecting said intermediate area from the deleterious effects of car washing brushes, flying objects, such as stones, and the like,

a plurality of plate retaining flange elements formed integrally of selective of said sections and including a first flange element on the upper most of said horizontally extending sections and a second flange element on the lowermost of said horizontally extending sections,

said flange elements defining plate edge receiving recesses with said outer and frontal wall portion of the associated frame sections and being located on the rearward side of said license plate and thus being totally concealed from the forward side of said frame by said plate when the same is assembled into said frame,

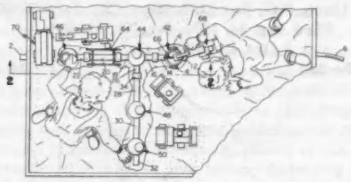
said frame being fabricated of a rigid yet deflectable material, such as ABS plastic, whereby assembly of said license plate into said frame may be achieved by inserting the side edges of said plate into the recesses defined by said rolled lateral edges of said support bracket and thereafter inserting one edge of said plate into of said plate edge receiving recesses, and biasing the horizontal section of said frame associated with the opposite horizontal edge of the plate outwardly to permit said opposite horizontal edge of said plate to be inserted within another of said plate edge receiving recesses, and when said force on said biased horizontal frame section is relieved, said section will move under the influence of the natural elasticity of the plastic material toward its normal position retaining said opposite horizontal plate edge within the associated of said slots, one of said recesses also receiving a horizontal edge of said support bracket.

4,170,839

CHILD'S TOY IN THE FORM OF A MINIATURE STORM SEWER SYSTEM

Robert J. O'Donnell, 15 Greely St., Hudson, N.H. 03051

Filed Dec. 30, 1977, Ser. No. 865,909
Int. Cl.[2] A63H *33/10*
U.S. Cl. 46—17 19 Claims



1. A child's toy in the form of a miniature storm sewer system set and comprising:

a plurality of pipes about one inch in diameter;

connector means sized and adapted to engage and connect together the adjacent ends of a pair of said pipes; and

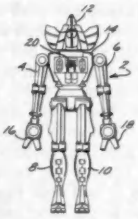
a plurality of simulated manholes each including in the side wall thereof spaced water passage holes each of which is sized and adapted to be connected to a said pipe.

4,170,840

TOY VEHICLE DOLL ASSEMBLY

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1978, Ser. No. 881,016
Int. Cl.[2] A63H *3/16*
U.S. Cl. 46—22 12 Claims



1. A toy assembly capable of forming a vehicle from individual sub-component parts comprising;

an articulated doll having appendages configured to simulate arms and legs;

a front carriage member having a first support member and a first pair of wheels for translation across a support surface;

a rear carriage member having a second support member and a second pair of wheels for translation across a support surface, and

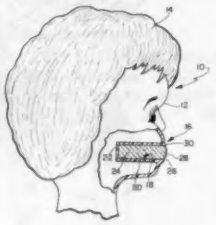
connector means on the articulated doll for operatively appending the respective front and rear carriage support members across the articulated doll wherein it forms an undercarriage frame for a vehicle for movement across the support surface by the respective pairs of wheels, the undercarriage frame positioned approximately parallel to the support surface and beneath the respective support members.

4,170,841

KISSING DOLL

Paul J. Sullivan, 300 Metacom Ave., Bristol, R.I. 02809, and Ernest Bridge, Jr., Woonsocket, R.I., assignors to Paul J. Sullivan

Filed Sep. 12, 1977, Ser. No. 832,426
Int. Cl.[2] A63H *3/36*
U.S. Cl. 46—171 10 Claims



1. A doll adapted to simulate kissing by leaving a lip imprint on objects contacted thereby comprising, a head having a face surface, said face surface including an inwardly directed cavity in the oral region thereof, said cavity terminating at an outer open end generally adjacent portions of said face surface, a pad of porous material positioned in said cavity, said pad terminating in an outer surface having lip extensions outwardly projecting therefrom and adapted to contact objects adjacent said face surface, said pad being impregnated with a fluid marking material and acting as a reservoir therefor whereby when said face surface is pressed against any such object, said lip extensions leave a lip imprint of said marking material thereon.

4,170,842

SYNTHETIC CASING FOR MUSHROOM BEDS

Benjamin B. Stoller, P.O. Box 1339, Santa Cruz, Calif. 95060

Continuation-in-part of Ser. No. 830,011, Sep. 1, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 917,937
Int. Cl.[2] A01G *1/04*
U.S. Cl. 47—1.1 7 Claims

1. A casing material for mushrooms beds comprising a moist absorptive material selected from the group consisting of clarifiber, which is a cellulosic fibrous material generated in the manufacture of sulfite pulp and consisting principally of pulp fiber and partially digested wood and bark, spent compost and ground cottonseed hulls, said absorptive material being mixed with activated carbon and ground limestone wherein the amount of moisture, based on the amount of absorptive material, is from about 40% to 50% by weight.

4,170,843

ROTATABLE HANGING PLANTER MOUNT

Muhammad Y. Talwani, Saddle Shop Rd., Box 91, Ringoes, N.J. 08551

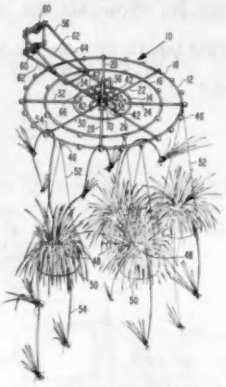
Filed Apr. 10, 1978, Ser. No. 895,015
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—39 10 Claims

1. A plant-mobile comprising:

(a) a mounting means adapted to hang from a wall or ceiling, said mounting means including a shaft; and

(b) a rotatable frame having at least one annular member including thereon plant support means for supporting potted plants, said annular member being attached to a central support member by a plurality of radial members, said central support member including means for rotably mounting said rotatable frame on said shaft of said mounting means, said rotatable frame being adapted to rotate in a substantially, horizontal plane, said plant support means

comprising a plurality of string-like elements each of which is attached to said rotatable frame and each of



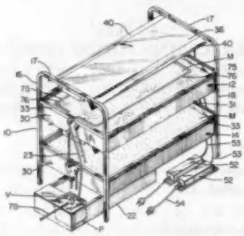
which is adapted to support a potted plant hanging therefrom.

4,170,844

HYDROPONIC GARDENING METHOD AND SYSTEM

Richard S. Steele, Broomfield, Colo., assignor to John E. Reilly, Denver, Colo.

Continuation of Ser. No. 651,463, Jan. 22, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,173
Int. Cl.[2] A01G *9/16, 9/14*
U.S. Cl. 47—62 **15 Claims**



1. In a hydroponic garden unit having upper and lower receptacles, each receptacle containing a growth media for plants therein and a reservoir beneath said lower receptacle containing a supply of acqueous nutrient solution, the improvement comprising:

nutrient solution circulating means between said reservoir and said upper receptacle including a first delivery line extending upwardly from said reservoir and substantially horizontally along the upper surface of the growth media in said upper receptacle, and filter block means in said first delivery line and disposed on the upper surface of the growth media to filter and diffuse the nutrient solution through the upper surface of the growth media in said upper receptacle,

nutrient solution circulating means including a second delivery line extending along the upper surface of the growth media in said lower receptacle, and filter block means in said second delivery line and disposed on the upper surface of the growth media for filtering and diffusing said nutrient solution into the growth media in the lower receptacle, and

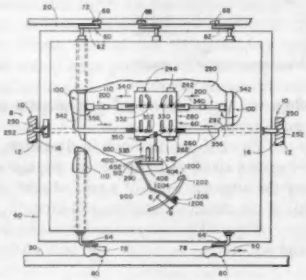
return line means including a first return line portion extending from the lower interior of said upper receptacle into communication with said second delivery line to deliver the nutrient solution along the upper surface of said lower receptacle, and said return line means including a second return line portion from the lower interior of said lower receptacle to said reservoir.

4,170,845

HYDRAULIC RAILROAD CAR DOOR WITH PROGRAM PLATE

Robert E. Owen, P.O. Box 1288, Sioux City, Iowa 51102

Filed Aug. 16, 1976, Ser. No. 714,801
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—220 **18 Claims**



1. A railroad car and door assembly having upper and lower guiding and supporting horizontal door tracks, a door jamb between said tracks, a sliding door between said door tracks and generally vertically extending and horizontally movable for opening and movable along said door tracks, an actuation mechanism for opening and closing said door comprising: upper right and left crank arms and lower right and left crank arms, said crank arms being generally horizontally extending and each having a track engaging means at one end making sliding and guiding and pivoting and door supporting engagement with a respective one of said door tracks, right and left vertically extending crank arm shaft assemblies, means rotatably mounting said crank arm shaft assemblies on said door, each crank arm having an inner end attached to a respective end of a respective crank arm shaft assembly, each crank arm having an outer end, means rotatably and slidably connecting the outer end of each of said crank arms to a respective one of said tracks whereby said door is supported through said crank arms and said crank arm shaft assemblies, right and left crank arm shaft assembly control bar assemblies extending transversely and inwardly of said door from respective crank arm shaft assemblies respectively, outer ends of said shaft assembly control bar assemblies being hingedly connected to said right and left control shaft assemblies respectively in a manner whereby horizontal motions of said control bar assemblies in each of two opposite directions will cause said shaft assemblies to rotate in each of two opposite directions, right and left door opening and closing track-and-track-follower assemblies each of which latter include a track and an inter-acting track follower forming respectively first and second inter-acting elements, one of said elements being attached to a respective one of said shaft control bar assemblies, means mounting the other of said elements respectively on said door in a movable manner for movement in each of two directions, a hydraulic cylinder assembly having one end attached to said door, means connecting the other end of said hydraulic cylinder assembly to the other of said elements, said means attaching the other of said elements movably to said door and said track-and-track-follower assemblies being so shaped that as the length of said hydraulic cylinder assembly is changed said shaft control bar assemblies will be caused to move in each of two opposite directions for causing said crank arm control shafts to swing said crank arms in directions for opening and closing said door

respectively, and means mounted on said door for selectively causing extension and retraction of said hydraulic cylinder assembly, said

means mounting said other element of each said track and track-and-track-follower assemblies movably on said door comprising a program plate and means movably attaching said program plate to said door for reciprocation in first and second opposite directions, said program plate having door position control slots therein, the walls of said door position control slots serving as said tracks, the other element of each of said track-and-track-follower assemblies being a pin disposed in a respective one of said door position control slots and guided by the walls of said door position control slots respectively as said program plate moves with respect to said door, said program plate defining said means for attaching said others of said elements movably to said door, said means connecting the other end of said hydraulic cylinder serving to attach said hydraulic cylinder other end to said program plate in a manner such that changes in the length of said hydraulic cylinder causes said reciprocations of said program plate, said

means mounted on said door for selectively causing extension or retraction of said hydraulic cylinder assembly comprising a hydraulic assembly having a cylinder and having a hydraulic pump and reservoir and having a controllable reversing valve assembly, and means mounted on said pump and said door for manual reciprocation of said pump, said pump having a piston and an inlet and an outlet, said pump being constructed for delivering fluid out of said outlet during movement of said piston in either of two directions, said hydraulic assembly having means connecting said controllable reversing valve to said outlet of said pump and to said reservoir and to said reversing valve in a manner such that the setting of said reversing valve in each of two different positions will cause said pump to extend and retract said hydraulic cylinder assembly respectively, said pump having

a housing provided with first and second interconnecting chambers, said pump piston having a first portion closely fitting and reciprocating in said first chamber, said first piston portion reciprocating along an axis, said piston having a second piston portion disposed at one side of said first piston portion and reciprocating therewith and extending along said axis and substantially filling said second housing chamber, said piston having a third portion attached to an opposite side of said first portion from said second piston portion, said third piston portion extending along said axis of reciprocation, said housing having an opening therethrough along said axis of reciprocation and in which said third portion of said piston reciprocates, said pump housing having an inlet extending from the exterior through the wall of said first chamber at an end of said first chamber which is adjacent said second chamber, said pump housing having an outlet at that end of said chamber which is farthest from said first chamber, said first piston portion having a first passage therethrough for hydraulic fluid, said first passage extending from a portion of said first piston portion which is closest to said outlet to that side of said first piston portion which is opposite from said outlet, a check valve in said first passage permitting flow of fluid therethrough only in a direction away from that end of said first piston portion which is adjacent said outlet, said piston having an out-flow second passage therethrough, said out-flow second passage having an inlet in communication with said first pump chamber and disposed on the opposite side of said first piston portion from said pump outlet, said out-flow passage having an out-flow opening on that end of said second piston portion which is adjacent to said pump outlet, said out-flow passage extending through said piston from its said inlet to its said outlet opening, a check valve in said out-flow passage permitting flow through said out-flow passage only in a direction from the inlet of said out-flow passage to the outlet opening of said out-flow passage whereby said check valves and passages function to cause oil to be pumped from said pump housing inlet out through said pump housing outlet as said piston is moved in each of two opposite directions along said axis.

4,170,846

AUTOMATIC BASE SEAL

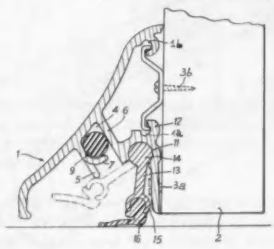
Claude G. Dumenil, and Louis P. Dumenil, both of 4075, Route de Neufchâtel, 76230 Bois Guillaume, France

Filed Jul. 5, 1977, Ser. No. 813,076

Claims priority, application France, Jul. 7, 1976, 76 20773; Apr. 26, 1977, 77 12517

Int. Cl.[2] E06B *7/20*

U.S. Cl. 49—303 **7 Claims**



1. Automatic base seal for a panel comprising a molding containing a driving means constituted by a deformable rod whose one extremity projects from one extremity of the molding, in the open position of the panel, and whose other extremity is fixed to the molding, said rod being forced axially into the molding by contact with the door-frame element of said one end at the time of the closing of the panel, and in deforming itself displaces an elongated section supporting a sealing element, characterized by the fact that said deformable rod is disposed in an internal longitudinal groove of said molding and supports itself by its other extremity against a stop in said groove spaced from an opposite extremity of the molding, said rod being guided between walls of the said groove and projecting laterally out of the said groove through a slot formed in the groove along one part of its length when the panel is closed, said rod displacing the elongated sealing element by forcing out an elongated support section positioned in said molding and supporting the sealing element, said molding having an external profile in the form of a drip molding and having at least four internal longitudinal grooves, the first being the groove receiving the deformable rod, the second groove receiving for pivoting movement the elongated support section of the sealing element which, in its retracted position in relation to the base seal, extends across the first groove, and means for mounting said molding on the panel and comprising slide elements connected to the panel for engagement in the third and fourth grooves, said slide elements and third and fourth grooves providing an invisible mounting for said molding.

4,170,847

TAILGATE WINDOW REGULATOR

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

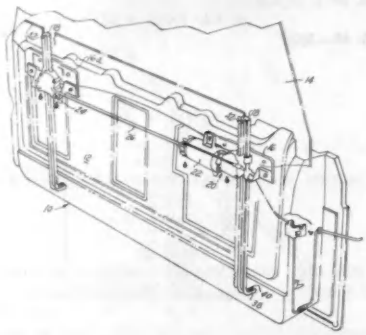
Filed Jun. 1, 1978, Ser. No. 911,371

Int. Cl.[2] E05F *15/08*

U.S. Cl. 49—349 **6 Claims**

1. A vehicle tailgate window regulator, in which the tailgate includes a well in its lower portion and a full width window movable between a position in which it is fully housed within the well, and an upper position in which it closes an opening

into the vehicle above the well, said regulator comprising a pair of substantially vertical racks fixedly mounted within the well at opposite sides thereof, a master drive assembly rigidly connected to the lower edge of the window adjacent one side thereof, said master drive assembly comprising a motor and a pinion connected to said motor and in mesh with the adjacent rack and a first guideway slidable on such rack, a slave drive assembly rigidly connected to the lower edge of the window adjacent the other side thereof, said slave drive assembly comprising a pinion in mesh with the rack adjacent thereto and a second guideway slidable on such rack, means including a drive shaft extending between said drive assemblies to insure synchronous rotation of said pinions and smooth vertical movement of the window, in which the means connecting said



motor to said drive pinion comprises a worm directly connected to said motor, a worm gear in mesh with said worm, a spline connection between said worm gear and pinion, said master drive assembly comprising a unitary plastic housing having an end shaped for attachment to a motor housing and an opposite end having an apertured projection in which the aperture is shaped to form said guideway to support and guide said housing on one of said racks, said housing having a recess open at one side to receive said worm and a shaft therefor, said housing having an opensided cavity shaped to receive said worm gear and the pinion connected to said worm gear, said cavity having an opening to said guideway through which said rack extends for meshing engagement with the associated pinion.

4,170,848

SLIDING DOOR

Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co., Ltd., Kumamoto, Japan

Division of Ser. No. 802,445, Jun. 1, 1977. This application Apr. 10, 1978, Ser. No. 894,708

Claims priority, application Japan, Jun. 2, 1976, 51-71245[U]; Jun. 2, 1976, 51-71246[U]; Jun. 15, 1976, 51-77928[U]

Int. Cl.[2] **E05F** *11/00*; **E05D** *13/04*

U.S. Cl. 49—358 **7 Claims**

1. A door adapted to be moved on a rail laid along a wall to close an opening in the wall, comprising:

a door body having a plurality of wheels, each of said wheels having an axle for mounting said wheels on said door body;

a manually rotatable means having a first shaft rotatably attached to the front side wall of the door body, said rotatable means being slidably movable back and forth along the axis of said shaft;

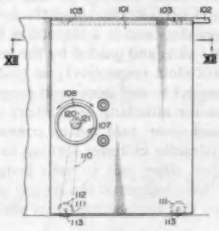
a rotary driving member of a predetermined diameter coaxially carried by said shaft;

a rotary driven member carried by one of said axles and having a diameter larger than that of said driving member;

an endless power transmission member connected between the driving and the driven members;

clutch means for transmitting the rotation of said first shaft to said driving member when the clutch means are engaged;

locking means having a second shaft operably coupled to said first shaft wherein the rotational movement of said first shaft is transmitted to said second shaft when said clutch means are disengaged, said locking means locking said door in the closed position when said manually rotatable means is operated;



gear means coupling said first and second shafts;

stopper means having detecting means partially extending out of the side end of said door body and positioned for detecting a wall contact, and engagement means positively locking said locking means in a fixed conditon when said detecting means are not actuated.

4,170,849

ROTARY MACHINE FOR THREE-DIMENSIONAL POLISHING OF WORKPIECES SHAPED AS SOLIDS OF REVOLUTION IN A MAGNETIC FIELD USING FERROMAGNETIC ABRASIVE POWDERS

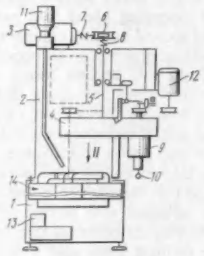
Faddei J. Sakulevich, pereulok Dalny, 3, and Alexandr A. Kosobutsky, ulitsa R. Ljuxemburg, 171, kv. 5, both of Minsk, U.S.S.R.

Filed Apr. 11, 1978, Ser. No. 895,475

Claims priority, application U.S.S.R., Jul. 26, 1977, 2513229

Int. Cl.[2] **B24B** *31/00*

U.S. Cl. 51—7 **2 Claims**



1. A rotary machine for three-dimensional polishing of workpieces shaped as solids of revolution in a magnetic field using ferromagnetic abrasive powders, comprising: an electromagnetic system incorporating an annular working air gap adapted for the workpieces being machined to pass therealong, said electromagnetic system being established by a number of separate segments having different magnetic induction which is gradually diminished along the direction of traverse of the workpieces being machined; a ferromagnetic abrasive powder accommodated in said magnetic air gap in such a manner that the space of said magnetic air gap in each of said segments is filled with said ferromagnetic abrasive powder of different fineness ratio which is gradually diminished along the direction of traverse of the workpieces being machined; a rotor arranged oppositely to said electromagnetic system; spindles spaced peripherally on said rotor and adapted to hold the workpieces

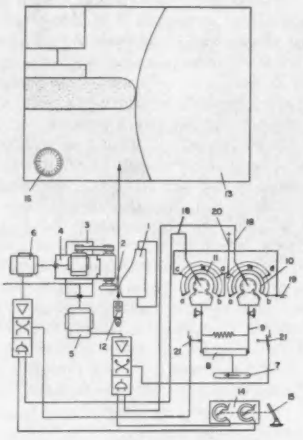
being machined so that with the rotor running, the workpieces being machined are made to traverse along said magnetic air gap of the electromagnetic system; a drive to impart rotation to said rotor; drives to impart rotation to said spindles round their own axes and oscillating motion thereto.

4,170,850

APPARATUS FOR COPY MACHINING HAVING A MANUAL CONTROL

Kálmán Horváth, and Brunó Erényi, both of Budapest, Hungary, assignors to Szerszámgépipari Müvek, Budapest, Hungary

Continuation-in-part of Ser. No. 834,823, Sep. 6, 1977, abandoned, which is a continuation of Ser. No. 653,151, Jan. 28, 1976, abandoned. This application Jun. 6, 1978, Ser. No. 913,050
Claims priority, application Hungary, May 7, 1975, SE 1781
Int. Cl.[2] B24B *49/12*
U.S. Cl. 51—165 R **3 Claims**



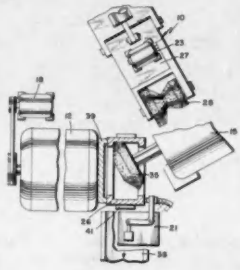
1. Apparatus for copy machining having a manual control and mechanical drive, preferably for optical profile grinding machine incorporating an optical system projecting an enlarged silhouette of the workpiece and a tool as well as an enlarged layout of the profile to be reproduced on a screen, the machine being provided with two slides driven by two DC motors having controllable speeds, said apparatus comprising a steering disc, two potentiometers having their respective output terminals connected respectively to respective ones of said motors, each of said potentiometers being divided into four equal parts by five tappings and having a sliding contact connected to a respective one of said output terminals, said steering disc being connected to said sliding contacts through a control disc and transmission mechanism, the first, middle and last one of said tappings being connected with each other and the remaining two tappings being connected to one another, forming respective first and second input terminals, said first input terminal of one of said potentiometers and said second input terminal of the other of said potentiometers being connected together and said second input terminal of said one potentiometer and said first input terminal of said other potentiometer being connected together, said potentiometers providing a phase position complying with the angular displacement by 90° of the steering disc.

4,170,851

GRINDING MACHINE

Ellsworth C. Enos, Holden, Mass., assignor to Cincinnati Milacron Heald Corp., Worcester, Mass.

Filed Sep. 20, 1977, Ser. No. 835,016
Int. Cl.[2] B24B *49/00*
U.S. Cl. 51—165.71 **4 Claims**



1. Grinding machine for finishing a radial surface on a workpiece having parallel radial end surfaces whose spacing varies within a range of tolerance and which are parallel to said radial surface, comprising:

(a) a base,

(b) a workhead mounted on the base for supporting the workpiece so that one of said radial end surfaces is located at a fixed location and for rotating it about a workpiece axis perpendicular to the said radial surfaces,

(c) a wheelhead mounted on the base and carrying an abrasive wheel with a radial surface for rotation about a wheel axis,

(d) feed means bringing about relative feed movement between the workhead and the wheelhead to cause the said radial surface of the wheel to grind the radial surface of the workpiece,

(e) a gage for measuring the distance between the radial end surfaces of the workpiece, and

(f) a control for determining the difference between the said measured distance and the corresponding distance between the radial end surfaces of a standard workpiece, obtaining one-half the said difference, and causing the said feed means to produce the feed movement in a direction parallel to said workpiece axis in an amount equal to a predetermined amount adjusted by the said one-half the said difference.

4,170,852

ARTICULATED PREFABRICATED MODULAR BUILDING AND METHOD OF ERECTING THE SAME

Benjamin G. Danis, Jr., Dayton, Ohio, assignor to Danis Industries Corporation, Dayton, Ohio

Filed Nov. 28, 1977, Ser. No. 855,215
Int. Cl.[2] E04B *1/343*
U.S. Cl. 52—71 **8 Claims**

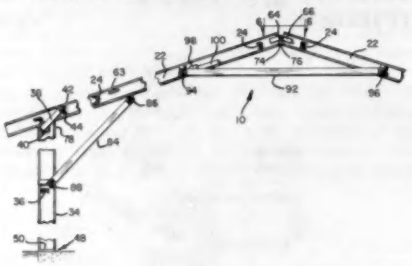
1. An articulated prefabricated modular building structure, comprising:

a pair of roof panels hingedly interconnected at adjacent end portions thereof and pivotal between a position in which said panels are disposed in a common horizontal plane and a position in which said panels are at a desired angle of inclination relative to one another so as to form a sloping roof;

a pair of side wall panels one each hingedly secured at an upper end portion to a respective one of said roof panels at end portions thereof remote from said interconnected end portions, said side wall panels each being movable between a folded position parallel to and underlying a respective roof panel and an erected position where said side wall panels are inclined relative to said roof panels;

means releasably holding said side wall panels in said folded position during transport of said structure to a site for erection; and

means defined on outer side edge portions of each roof panel for engagement by a lifting means for positioning said



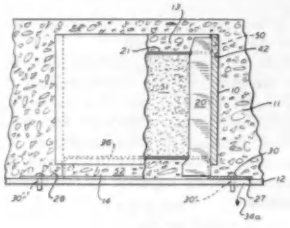
structure at a site for erection, said defined means on each roof panel lying in a plane orthogonal to that roof panel and substantially containing the center of gravity of that panel and an associated side wall panel when said side wall panel is in said folded position.

4,170,853

INSERT VOID FORMING DEVICE

John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Nutley, N.J.

Filed Sep. 30, 1977, Ser. No. 838,089
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—99 **15 Claims**



1. A void forming device for use in forming a void in a structural member such as a floor, formed of material thereabout, said device comprising:

(a) an elongated tubular member,

(b) a cap plate for positioning at the upper portion of said tubular member,

(c) a bottom plate proportioned for positioning at the lower portion of said tubular member,

(d) said cap plate and bottom plate being provided with slots defining flat, elongated openings therein,

(e) flat, elongated struts proportioned to be positioned in the tubular member between the cap plate and bottom plate, and tubular member,

(f) said struts having opposite ends formed complementarily to said cap plate and bottom plate slots for interlocking therewith, thereby connecting said cap and bottom plate,

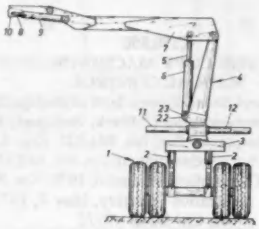
whereby the device will form a barrier void around which the structural member may be formed and defining a void in said structural member and whereby, when said device is removed, an electrical insert device may be positioned in said void.

4,170,854

JOINT BETWEEN THE LOWER PORTION AND THE MAIN PORTION OF A LOADING CRANE POST AND A METHOD OF PROVIDING SUCH A JOINT

Jan B. Palmcrantz, Harmånger, and Ulf C. Rilbe, Hudiksvall, both of Sweden, assignors to HIAB-FOCO Aktiebolag, Sweden

Filed Dec. 15, 1977, Ser. No. 860,681
Claims priority, application Sweden, Jan. 18, 1977, 7700459
Int. Cl.[2] E04H *12/34*
U.S. Cl. 52—115 **2 Claims**



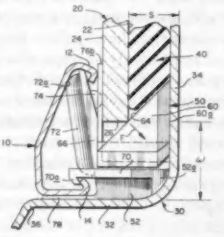
1. In a rotary crane boom including a main post having upper and lower post sections formed of high strength metal and requiring joining without welding and without the use of connecting bolts, the lower post section adapted for rotational mounting on an upright axis on a crane base and including an integral ring gear adapted to be driven by a reciprocating rack, the improvement comprising a thick walled upright axis sleeve member on the bottom of the upper post section and being comparatively short axially and being internally screw-threaded, a coacting thick walled upright axis tubular member on the top of the lower post section and being externally screw-threaded and having screw-threaded engagement within the screw-threaded bore of said sleeve member of the upper post section, and an external continuous rigid flange on said tubular member immediately below the external screw threads thereof and extending radially outwardly of said screw threads and having an upper flat annular face in solid abutment with a coacting bottom flat annular face on said sleeve member when said internal and external screw threads of said sleeve member and tubular member are fully engaged.

4,170,855

MOLDING FASTENERS

Ronald A. Murray, Methuen, Mass., and Peter D. Wright, Londonderry, N.H., assignors to TRW Inc., Cleveland, Ohio

Filed Jul. 22, 1977, Ser. No. 818,025
Int. Cl.[2] E04B *1/62*; E06B *3/58*
U.S. Cl. 52—400 **29 Claims**



1. A fastener for attaching a strip element across a gap between the edge of a panel and a support surface supporting the panel, the panel including an inside major surface, and outside major surface, a peripheral edge and an inside peripheral corner between its edge and its inside major surface, the support

surface including a first side portion spaced from and adjacent to the edge of the panel and a second side portion spaced from and adjacent to the inside major surface of the panel, said fastener being structured for positioning itself in the gap relative to the support surface rather than relative to the edge of the panel, said fastener comprising:

A. a base adapted to fit within the gap between the first side portion of the support surface and the edge of the panel;

B. first and second wings projecting in essentially opposite directions upwardly and outwardly from said base, said wings being resiliently deflectible downwardly relative to said base, the free end of each of said wings including a beveled bearing face oriented such that, when said fastener is mounted in the gap, said beveled faces resiliently bear against the inside peripheral corner of the panel and develop an oblique reacting force tending to load said fastener against both the first and second side portions of the support surface, said beveled faces being of sufficient length to resiliently bear against the inside peripheral corner of the panel and to develop the oblique reacting force despite variations in either direction from a normal spacing in the spacing between the inside major surface of the panel and the second side portion of the support surface; and

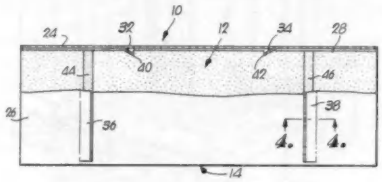
C. means projecting from said base for engaging and retaining the strip element across the gap.

4,170,856

METAL ENCASED REFRACTORY BRICK

John J. Musser, Kansas City, Mo., assignor to Geo. P. Reintjes Co., Inc., Kansas City, Mo.

Filed Mar. 20, 1978, Ser. No. 890,609
Int. Cl.[2] E04C *2/04*
U.S. Cl. 52—598 **12 Claims**



1. A refractory brick unit resistant to heat induced expansion spalling comprising:

a heat resistant brick body having at least one sidewall which is adapted to be disposed adjacent the side of another proximal brick in refractory construction; and

a metallic member having at least a section thereof overlying said one sidewall of the brick body in at least partial covering relationship thereto and spaced from the face of said one sidewall,

there being a plurality of elongated indented surfaces in said one sidewall of the brick body defining each of a plurality of spaced depressions therein,

said brick body being provided with a pair of surfaces defining each of the depressions in said one sidewall thereof with one of said surfaces being in substantially perpendicular relationship to said one sidewall of the brick body while the other depression defining surface is inclined with respect to said one surface and said one sidewall of the brick body,

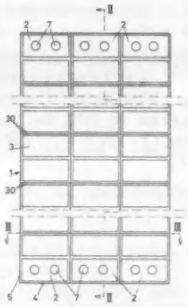
said section of the metallic member being provided with extension means thereon projecting into each of the depressions, each of said extension means comprising an elongated tab integral with said section of the metallic member and having a free end which engages a corresponding inclined depression defining surface of the brick body in normally spaced relationship from said one surface proximal thereto, said extension means at least partially supporting said section of the metallic member in said spaced relationship from said one sidewall of the brick body whereby when the brick unit is laid side-by-side with another brick with the metallic section in abutting relationship to said other proximal brick, the space between the section of the metallic member and said one sidewall of the brick body accommodates expansion of the brick body during heating thereof without spalling attributable to pressure engagement with said other brick.

4,170,857

FACADE CONSTRUCTION

Walter Rieger, Gmunden, Austria, assignor to Bauhütte Leitl-Werke Rieger-Anlagentechnik GmbH, Linz, Austria

Filed Aug. 19, 1977, Ser. No. 826,255
Claims priority, application Austria, Aug. 20, 1976, 6182/76
Int. Cl.[2] E04D *1/00*
U.S. Cl. 52—513 **7 Claims**



6. A facade construction including plate-like construction elements arranged beside and above one another in front of a wall and holding means for holding said plate-like construction elements at a distance from said wall, said plate-like construction elements having cavities, for airing purposes, which cavities are in connection with the outer air at least near the upper end and the lower end of the facade construction, and edge faces, said plate-like construction elements being joined to one another without mortar along their adjoining edge faces, and connecting means having a first portion secured to said wall and a holding portion extending into one of the cavities through a recess provided between adjoining edge faces of adjoining plate-like construction elements, the volume of said cavity being substantially larger than the volume of said holding portion located therewithin to provide for substantial ventilation, said holding portion comprising a clamp including resilient arm means, said resilient arm means including a first resilient arm connected with said first portion secured to said wall, and a second resilient arm engageable with an inner side of said cavity.

4,170,858

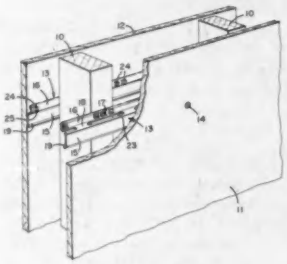
RESILIENT RUNNER FOR WALL CONSTRUCTION

Keith W. Walker, Lake Zurich, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 802,688, Jun. 2, 1977, abandoned. This application Aug. 18, 1978, Ser. No. 935,058
Int. Cl.[2] E04C *3/32*
U.S. Cl. 52—735 **4 Claims**

1. A sheet metal resilient runner for the attachment of wallboard to a supporting structure comprising a base flange, a support portion offset laterally from said base flange, a resilient web integral with the base flange and the support portion and extending at an inclined angle therebetween, a stop flange integral with the support portion and extending at an inclined

angle toward the plane of said base flange, and a fastening plate offset laterally from said base flange in generally parallel rela-



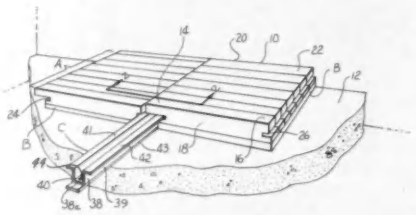
tion thereto and integrally connected to the base flange by a connecting strip extending therebetween.

4,170,859

COMPOSITE STRUCTURE AND ASSEMBLY JOINT FOR A FLOOR SYSTEM

James Counihan, 2 Williams Dr., Greenville, S.C. 29605

Filed Oct. 14, 1977, Ser. No. 842,176
Int. Cl.[2] E04B *5/52*; E06B *3/54*
U.S. Cl. 52—763 **8 Claims**



1. In a structural system of the type for constructing floor structures having a planar top wear surface provided by a plurality of wood boards substantially identical in length arranged generally in a side-by-side and end-to-end abutting configuration, apparatus for assembling said boards comprising:

(a) each said board being substantially elongated to define a first end, a second end remote from said first end, a pair of spaced elongated longitudinal sides extending between the first and second ends, a planar bottom surface integral with and bridging said sides, and said top wear surface spaced from said bottom surface integral with and bridging said sides;

(b) said first end of each board including:

(i) an upper end portion,

(ii) a lower end portion spaced below and terminating longitudinally short of said upper end portion; and

(iii) a groove defined between said upper and lower end portions being open at said first end;

(c) said second end of each board including:

(i) an upper end portion,

(ii) a lower end portion spaced below said upper end portion extending longitudinally past said upper end portion, and

(iii) a groove defined between said upper and lower end portions being open at said second end,

(d) an elongated channel strip for being fastened to an associated subfloor structure including first and second generally horizontally outwardly extending flange means;

(e) a n end assembly joint defined by the abutment of the first end of one board with the second end of another board in said system;

(f) said assembly joint including lengths of said channel strip extending generally across the entire width of said structure surface being formed contiguously across each said assembly joint in said system joining said boards in a side-by-side arrangement, said flange means of said channel strip being received in said groove of said first end and in said groove of said second end, said upper end portion of said second end extending over a portion of said first flange means and said upper end portion of said first end extending over said second flange means and the remaining portion of said first flange means generally abutting said upper end portion of said second end; and

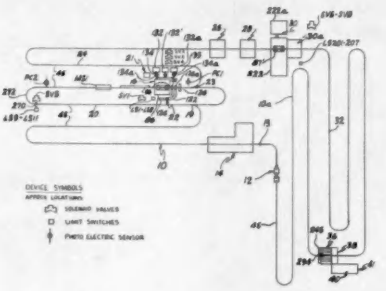
(g) said plurality of boards being joined in side-by-side arrangement by said assembly joint connecting said ends with said planar longitudinal sides being essentially devoid of interconnection therebetween.

4,170,860

CANDLE MANUFACTURING SYSTEM AND METHOD

Robert W. Flinn, Lakewood, Ohio, and Roy D. Robinson, Osceola, Ark., assignors to American Greetings Corporation, Cleveland, Ohio

Division of Ser. No. 777,429, Mar. 14, 1977, Pat. No. 4,131,415.
This application Oct. 2, 1978, Ser. No. 948,086
Int. Cl.[2] B29C *13/00, 17/10*
U.S. Cl. 53—170 **34 Claims**



1. In a system for the production of dipped taper candles including a mobile carrier rack suspended from an overhead conveyor system, a wicking station for providing candle wicks and for attaching the latter in generally tensioned suspended relation to said rack, a dipping station including a tank for automatically dipping the wicks on said rack through a predetermined number of dipping cycles, for forming candles on the wicks, a cut-off station for cutting off the bases of the candles suspended from said rack, the last mentioned station including means for clamping the candles during the cutoff operation, a butt forming station for forming the cut butts on candles suspended from said rack, said butt forming station including means for holding the candles in generally stationary relation to the rack during said butt forming operation, and a cut down station for cutting down the candles from said rack.

4,170,861

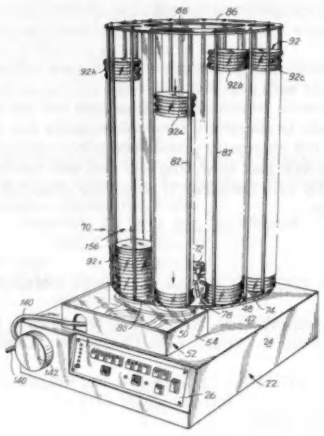
METHOD AND APPARATUS FOR FILLING PETRI DISHES

Philip Snyder, Lawrenceville, and David Freedman, Highland Park, both of N.J., assignors to New Brunswick Scientific Co., Inc., Edison, N.J.

Filed Apr. 7, 1978, Ser. No. 894,317
Int. Cl.[2] B65B *3/26, 43/40*
U.S. Cl. 53—468 **24 Claims**

1. In a method for filling petri dishes each with a given quantity of agar, wherein each petri dish includes a lower dish

member and an upper lid member normally covering and extending loosely downwardly around the exterior of the dish member, the steps of situating a stack of empty petri dishes at a dish-drop station while supporting the lowermost petri dish of the stack on a stationary support with all of the remaining petri dishes of the stack at the dish-drop station resting on the lowermost petri dish, displacing the lower-most petri dish horizontally beyond the stationary support while preventing the next petri dish directly above the lowermost petri dish from being displaced with the latter and freeing said next petri dish to drop onto said stationary support as soon as the lowermost petri dish has been moved horizontally beyond said stationary support, so that the entire stack drops onto the stationary support as soon as the lowermost petri dish has been displaced beyond the stationary support, situating beneath the lowermost petri dish which has been displaced from said stationary support a movable support onto which the lower dish member of the lower-most petri dish falls, while simultaneously preventing the lid member of the lowermost petri dish from falling with the lower dish member thereof and maintaining the lid member, from which the lower dish member drops,



vertically aligned above the lower dish member, and moving the lower dish member, by way of the movable support, and the lid member aligned with said lower dish member, while they are vertically spaced from each other, to a filling station where a filling nozzle extends into the space between the lower dish member and upper lid member, filling a predetermined quantity of agar into the lower dish member at the filling station from said nozzle, then displacing the filled lower dish member, while maintaining the upper lid member vertically aligned therewith and spaced therefrom, by way of said movable support to an elevating station, elevating the lower dish member which is at the elevating station upwardly into the lid member situated thereover for closing the filled petri dish, and then continuing the elevation of the closed petri dish up to and beyond a predetermined elevation while preventing downward movement of the filled petri dish below said predetermined elevation, and repeating the above steps with each petri dish which drops onto the stationary support so that while a stack of empty petri dishes is being lowered one by one and becomes of a progressively smaller height, at said stationary support, a stack of filled petri dishes is being formed one by one and has a gradually increasing height, at said elevating station.

4,170,862

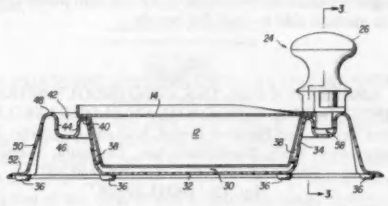
METHOD OF AND APPARATUS FOR MANUALLY CLOSING FOIL CONTAINERS AND TOOL THEREFOR

Frank S. Lazure, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jul. 10, 1978, Ser. No. 923,173

Int. Cl.[2] B65B *7/28*

U.S. Cl. 53—471 **18 Claims**



10. A method of closing foil containers of the type having a generally horizontally extending shoulder for supporting a closure lid and an upstanding closure flange foldable over onto a closure lid, said method comprising the steps of

(a) filling said container with a product,

(b) placing a closure lid for said container on said generally horizontally extending shoulder,

(c) inserting said container into a pocket means of a die closure member,

(d) progressively folding the upstanding flange of said container in a single direction onto said closure lid by means of

(1) inserting a hand-held closure tool in track means surrounding said pocket means,

(2) and camming said upstanding flange means of said container onto the upper surface of said closure lid by advancing said tool member in said track means surrounding said pocket means.

4,170,863

APPARATUS FOR THE CONTINUOUS PRODUCTION OF PACKAGES

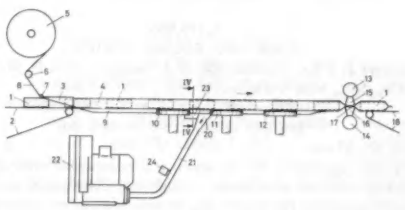
Hugo Schwanz, Rielasingen, Fed. Rep. of Germany, assignor to Sig Schweizerische Industriegesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Feb. 1, 1978, Ser. No. 874,357

Claims priority, application Switzerland, Feb. 2, 1977, 1249/77

Int. Cl.[2] B65B *31/06*

U.S. Cl. 53—511 **9 Claims**



1. In apparatus for the continuous packaging of objects, including a conveying device which supplies the individual objects or groups of objects to be packaged, means supplying an endless band of packaging material, a folding box for shaping the endless band into a tube which encloses the objects or groups of objects and two contacting flaps which protrude from the tube, conveying means downstream of said box for advancing the tube, welding members for welding the flaps together to form a longitudinal seam, and welding and cutting devices for producing transverse seams in the tube to define

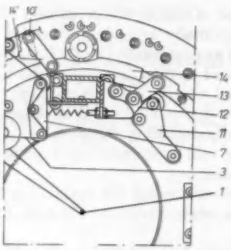
individual packages, and for severing the individual packages from one another, the improvement wherein said conveying means comprise a pair of unheated guide rollers, said welding members comprise a pair of heated welding rollers, and said apparatus further comprises a flat nozzle extending in the longitudinal direction of the tube and disposed downstream of said folding box between said pair of guide rollers and said pair of welding rollers so that the outlet end of said flat nozzle engages between the two flaps; and a vacuum pump connected via its suction side to said flat nozzle.

4,170,864

APPARATUS FOR THE CONTINUOUS SPIRAL WINDING OF A TAPE ONTO AN ELONGATED BODY

Robert Beyerl, and Richard Beyerl, both of Grangärde, Sweden, assignors to SHA, Torshällaverken, Torshalla, Sweden

Filed Oct. 25, 1977, Ser. No. 844,837
Int. Cl.[2] B65H *81/08*
U.S. Cl. 57—3 **2 Claims**



1. An apparatus for continuously winding a tape about an elongated body comprising a series of rolls defining a circular spool having a cylindrical surface, having at least one opening in its periphery, means for passing said elongated body through the center of the spool, means for continuously rotating the hollow circular spool, means for feeding a tape to said hollow circular spool to form several convolutions of the tape on the spool, means for unwinding the tape from the spool and passing the tape through the opening onto the elongated body, tension compensating means for acting upon the tape when passing between the opening and the elongated body, and tapebreaking avoidance means actuated by the tension compensating means for moving the rolls radially inward of said spool when the tension of the tape decreases suddenly due to breakage, thereby decreasing the circumference of said spool to facilitate catching of the broken end of the tape and retrieval thereof.

4,170,865

YARN SLUBBING DEVICE

Herbert J. Pike, Martinsville, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,148
Int. Cl.[2] D02G *3/34, 3/36, 1/16*
U.S. Cl. 57—6 **4 Claims**

1. An apparatus for producing a composite novelty yarn having slubs of selectively varied size distributed along the linear length of the yarn with selectively varied spacing, said apparatus comprising:

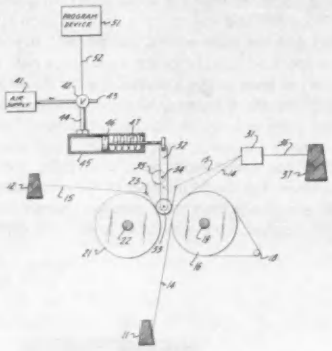
(a) A fluid texturing jet for combining a multifilament core yarn and a multifilament effect yarn into a composite yarn;

(b) Yarn supply sources for supplying said core yarn and said effect yarn to said texturing jet;

(c) Means to feed said core yarn to said jet at a constant feeding speed;

(d) Feed roll means for said effect yarn including a slow feed roll operable to feed said effect yarn to said jet at a speed within the range of ±15% of said core yarn feeding speed, and a fast feed roll spaced from said slow feed roll and operable to feed said effect yarn at a speed which is at least 10% faster than said core yarn feeding speed and at least 2% faster than the feeding speed of the effect yarn slow feed roll;

(e) An actuator arm which is pivotally mounted in its center portion and has an idler roll at one end and an air cylinder device attached to the other end which pivotally moves said actuator arm when air is introduced into or released from said air cylinder;



(f) Guide means directing said effect yarn into continuous contact with said idler roll, and

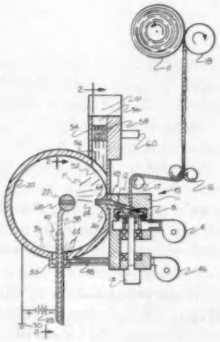
(g) Means to control the air flow into and out of said air cylinder to selectively move said actuator arm so that said idler roll alternately presses said effect yarn into engagement with said slow feed roll and said fast feed roll to thereby vary the speed at which the effect yarn is fed to the jet.

4,170,866

PROCESS AND APPARATUS FOR PRODUCING OPEN-END SPUN YARN

Frank A. Aschenbrenner, RR#13, Box 489, Muncie, Ind. 47307, and William V. Wright, 2412 Cloister Dr., Charlotte, N.C. 28211

Filed Jul. 31, 1978, Ser. No. 929,661
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.95 **24 Claims**



1. An open-end spinning process for producing spun yarn from staple fibers using an electrostatic field and a spinning rotor comprising:

(a) continuously feeding staple fibers to an electrostatic field,

(b) electrostatically straightening and generally linearly orienting said fibers in said field,

(c) withdrawing said fibers aerodynamically from said field

in generally linearly oriented and straightened disposition and feeding said withdrawn fibers aerodynamically onto the surface of said spinning rotor in generally linearly oriented and straightened disposition,

(d) rotating said rotor to cause said fibers thereon to be centrifugally gathered and combined to form a strand of fibers, and

(e) continuously withdrawing and twisting said fiber strand from said rotor to form a spun yarn.

14. Apparatus for producing an open-end spun yarn from staple fibers comprising:

(a) means for creating an electrostatic field,

(b) means for continuously feeding staple fibers to said electrostatic field for electrostatically opening, straightening and linearly aligning said fibers in said zone,

(c) a body disposed adjacent said field and having a rotor chamber therein,

(d) a spinning rotor rotatably disposed in said chamber,

(e) a passageway in said body extending from said field to said chamber for feeding said fibers from said field onto the surface of said rotor,

(f) suction means for drawing air through said chamber and passageway for withdrawing said straightened and aligned fibers from said field and feeding said fibers into and through said passageway onto said rotor surface,

(g) means for rotating said rotor for centrifugally straightening, aligning, and combining said fibers deposited onto the surface thereof so as to form a strand, and

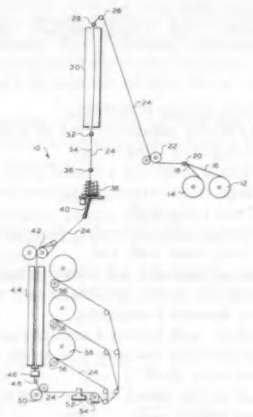
(h) means for continuously withdrawing said fiber strand in twisted form from said rotor to form a spun yarn.

4,170,867

SPUN-LIKE CONTINUOUS MULTIFILAMENT YARN

James C. Leininger, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 27, 1978, Ser. No. 881,478
Int. Cl.[2] D02G *3/04, 3/24*
U.S. Cl. 57—245 **24 Claims**



1. A continuous multifilament yarn, a predetermined length of said yarn comprising:

a first component yarn having a least one first simultaneously draw textured filament, each first filament having a first crimp amplitude, a first crimp frequency and a first length;

a second component yarn having at least one second simultaneously draw textured filament, each second filament having a second crimp amplitude, a second crimp frequency and a second length, said second crimp amplitude being less than said first crimp amplitude, said second crimp frequency being greater than said frist crimp frequency, and said second length being greater than said first length; and

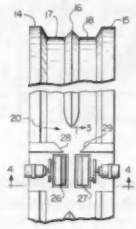
said second component yarn being distributed along and about said first component yarn substantially free of any reversing helices of said second component yarn whereby said continuous multifilament yarn formed thereby exhibits the effective appearance of a yarn spun from staple fibers.

4,170,868

YARN FORMING APPARATUS WITH MECHANICAL NODE LOCKING

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to WWG Industries, Inc., Rome, Ga.

Continuation-in-part of Ser. No. 755,671, Dec. 30, 1976, Pat. No. 4,074,511. This application Feb. 6, 1978, Ser. No. 875,091
The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.
Int. Cl.[2] H01B *13/04;* **D02G** *3/26*
U.S. Cl. 57—293 **9 Claims**



1. An improved apparatus for joining synthetic yarn strands in a machine of the type having means for forming at least two singles yarn strands, means for twisting each of said strands individually to form false-twisted strands, each having longitudinally spaced nodes at which the direction of twist reverses, rotatable guide means having a central axis and a peripheral surface for guiding and carrying said strands into spaced substantially parallel paths with the nodes of said strands substantially aligned with each other, means at a predetermined location on said guide means for bringing the nodes of said strands into contact with each other, and means for joining said strands to each other at the nodes, the improvement wherein said means for joining comprises

means for engaging and mechanically entangling the fibers of the yarn strands at the nodes to lock the nodes to each other.

4,170,869

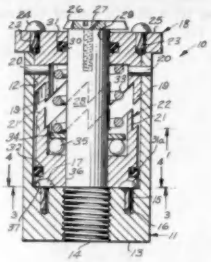
AIR OPERATED HOUR CLOCK

Edgar W. Bremer, P.O. Box 47, Okolona, Ohio 43550

Filed Dec. 15, 1977, Ser. No. 860,858
Int. Cl.[2] G04B *1/26*
U.S. Cl. 58—42 **1 Claim**

1. An air operated hour clock, comprising a hollow cylindrical main body, which receives air under pressure, a toothed piston rotor slidably received in said cylindrical main body for intermittent engagement with similar teeth of a cap secured to one end of said main body, a shaft with spring return means secured in said toothed piston rotor, and the engagement of the teeth of said toothed piston rotor with the teeth of said cap provides rotation of said shaft and a pointer arm secured to the external end of said shaft; said main body being secured fixedly at its open end to said cap by a pair of oppositely opposed pins and the end walls of said main body threadingly receives a compressed air attachment through which air under pressure operates said clock, and said shaft is fixedly secured, at one end, in said toothed piston rotor, and is freely and slidably

received in an opening of said cap, at its opposite end, the opening of said toothed piston rotor, and the opening of said cap receiving said shaft, being positioned along the longitudinal axis of said main body, and said pointer arm is secured rigidly to the extending portion of said shaft by suitable fastener means; the outer face of said cap being provided with a plurality of radially and equally spaced-apart drive screws, which are fixedly secured in openings of said cap, the heads of said drive screws serving as one-hour indication means through the rotation of said pointer arm, and said spring return means for said shaft comprises a coil spring received freely on the outer periphery of said shaft, and said spring abuts at one end with the inner face of said cap, and abuts at its opposite end with a washer in engagement with a thrust bearing received within said toothed piston rotor, and when said shaft and said



toothed piston rotor are urged towards said cap by air under pressure, the said teeth of said toothed piston rotor camingly engage with the said teeth of said toothed cap, thus rotating said shaft, and its attached said toothed piston rotor, a predetermined number of degrees, which is indicated by means of said pointer arm with respect to the said heads extending from said cap; the pressure of air, after being released, causes said spring to urge said toothed piston rotor away from said toothed cap, and returns said toothed rotor to the end wall of said main body; and the downward force of said spring causes a pair of a plurality of indentations, on a face of said toothed piston rotor, to camingly engage with a pair of heads of drive pins fixedly secured in the said end wall of said main body, which rotates said toothed piston rotor another pre-determined number of degrees prior to said piston rotor seating on said end wall.

4,170,870

CONTROL UNIT FOR ELECTRONIC TIME-PIECE DISPLAY

Michel Burdet, Aegerten, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Continuation of Ser. No. 378,626, Jul. 12, 1973, abandoned. This application Jan. 21, 1975, Ser. No. 542,656

Claims priority, application United Kingdom, Jul. 12, 1972, 32576/72

Int. Cl.[2] **G04B** *19/24;* **G04C** *3/00;* **G04B** *19/30*

U.S. Cl. 58—50 R **4 Claims**

1. In an electronic time-piece having a time standard, a plurality of time keeping counters connected in series, means responsive to said time standard for applying a sequence of time pulses to one of said time keeping counters, and display means responsive to said time keeping counters for displaying information contained in said time keeping counters, the improvement comprising a time correction means having only two manual switches for effecting time correction, said time correction means comprising:

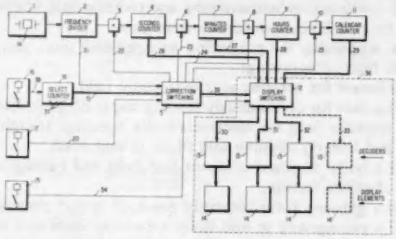
selection counter means;

a manually operable selection switch means connected to said selection counter for advancing the count therein to select one of said time keeping counters for correction;

a correction switching means;

a manually operable correction switch means for controlling said correction switching means;

means responsive to said time standard for applying a sequence of correction pulses to said correction switching means;



means for applying to said correction switching means signals representing the count in said selection counter means; and,

means connecting said correction switching means to said time keeping counters so as to direct said correction pulses to the time keeping counter specified by the count in said selection counter means when said manually operable correction switch means is operated.

4,170,871

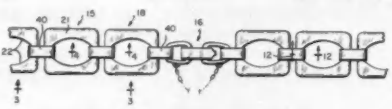
BRACELET LINKAGE

Wallace F. Vanover, and Kurt A. Rieth, both of Warwick, R.I., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 15, 1978, Ser. No. 933,963

Int. Cl.[2] **A44C** *5/10*

U.S. Cl. 59—82 **10 Claims**



1. A bracelet linkage comprising

a plurality of link assemblies each of which comprises,

a thin outer shell comprising,

an outer wall having a central transverse opening, side flange means extending downwardly from the sides of said outer wall,

end flange means extending downwardly from the ends of said outer wall, and

a pair of bendable tab means extending downwardly from the central portions of said end flange means,

an inner member comprising,

a bottom wall having a central transverse opening of substantially the same size as the central opening of said outer shell,

a pair of side members extending upwardly from said said bottom wall,

a pair of end members extending between said side members,

a pair of first groove means one extending inwardly from each of the central portions of said end members, and

a pair of second groove means one extending inwardly from the bottom wall of each of said first groove means towards the adjacent portion of the central opening of the bottom wall,

said outer shell being secured to the inner member by inserting said bendable tab means in said first groove means and bending their lower ends thru

said second groove means and about the adjacent portions of the end members of the inner member, and means for connecting a plurality of said link assemblies together in end-to-end relationship to form a linkage for a bracelet.

4,170,872

BRACELET LINKAGE

Wallace F. Vanover, and Kurt A. Rieth, both of Warwick, R.I., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 15, 1978, Ser. No. 933,715
Int. Cl.[2] A44C *5/10*
U.S. Cl. 59—82 **17 Claims**

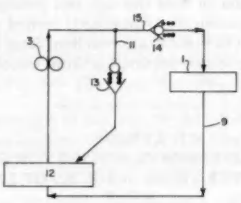
1. A bracelet linkage comprising,
a plurality of link assemblies each of which comprises,
an outer member comprising
a pair of spaced side members,
a pair of spaced end members extending between the side members to define a frame having a central opening, and
a pair of bendable tab means, one extending downwardly from each of said end members,
an insert receivable within said outer member, said insert having an upper member exposed by said opening
an inner member comprising
a bottom wall,
side flanges extending upwardly from said bottom wall,
a pair of end members extending between said side flanges and
a pair of slot means at the junction of lower portions of said end members and the adjacent end portions of said bottom wall,
said bendable tab means being bent about said end members of the inner member with their ends extending through said slot means, whereby the outer member, the insert and the inner member are retained in superimposed positions by said tab means to form a link assembly, and
means for connecting a plurality of said link assemblies together in end-to-end relationship to form a bracelet.

4,170,873

LUBRICATION SYSTEM

George T. Milo, Bridgeport, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Jul. 20, 1977, Ser. No. 808,264
Int. Cl.[2] F02C *7/06*
U.S. Cl. 60—39.08 **2 Claims**



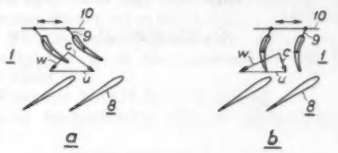
1. In a gas turbine engine, an oil supply system for the bearings which support the engine shaft comprising:
a sump for storing a quantity of bearing lubricating oil;
a manifold having integrally formed ducts connected in the oil supply system to distribute oil from the sump to the bearings, said manifold having a cavity to accommodate a pump in communication with said ducts;
a positive displacement pump driven by the engine shaft, mounted in the manifold cavity, and connected to the integrally formed ducts and the sump to discharge oil from the sump into said ducts;
a bypass duct integrally formed in the manifold to provide a bypass channel back to the sump for oil discharged from the pump;
a control valve operatively inserted in the bypass duct to control the oil flow therein, said valve having a valve body constructed with an inner chamber, said chamber having inlet and outlet orifices communicating with the bypass duct, a valve stem is mounted for movement within the inner chamber which engages the outlet orifice to vary the size thereof; said valve stem being biased to open said orifice during oil pressures indicative of engine idle speeds and to gradually close said orifice as the oil pressure indicates engine speeds increasing above idle speed; and
a check valve operatively connected to the integrally formed ducts within the manifold downstream of the bypass duct to block the oil flow to the bearings during the low engine speeds which occur after engine startup and engine shutdown.

4,170,874

GAS TURBINE UNIT

Ben Kyrklund, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Continuation of Ser. No. 632,395, Nov. 17, 1975, abandoned, which is a continuation of Ser. No. 414,379, Nov. 9, 1973, abandoned. This application Nov. 21, 1977, Ser. No. 853,114
Claims priority, application Sweden, Nov. 13, 1972, 14684/72
Int. Cl.[2] F02C *7/06;* **F01D** *17/14*
U.S. Cl. 60—39.18 C **4 Claims**

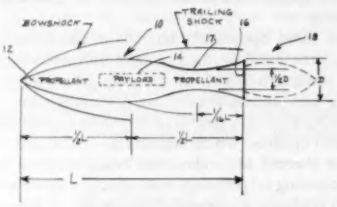


1. In a gas turbine power plant unit, including in sequence, an expansion turbine connected to the input end of a compressor and a main turbine connected to the output end of the compressor by way of a combustion chamber for supplying a flow of hot gas to drive the main turbine, the expansion turbine being provided with adjustable guide vanes for directint the flow of air thereto; the improvement which enables the expansion turbine to operate alternately as compressor and auxilliary turbine without use of clutch means with consequent minimized power losses, said improvement comprising:
(a) a rotor for said expansion turbine, comprising a series of fan blades having the profile of a symmetrical air foil;
(b) said guide vanes being adjustable relative to said fan blades to direct the flow of air to said air foil blades to vary their angle of attack relative to the air flow to provide the sole means for continuously alternating the operation of said expansion turbine between maximum compressor operation and maximum turbine operation in response to variations in power plant load conditions between full load and idle load respectively;
(c) said expansion turbine, said compressor, and said main turbine being mounted on an uninterrupted common shaft.

4,170,875
CASELESS ROCKET DESIGN

Lawrence J. Edwards, Camp Springs, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 10, 1976, Ser. No. 694,262
Int. Cl.[2] F02K 9/04
U.S. Cl. 60—253 5 Claims

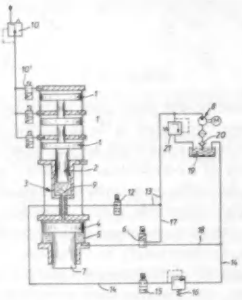


1. A "caseless" rocket comprising substantially entirely of a body portion, said body having a centrally located enclosed cavity therein for carrying articles, said body being made substantially completely of solid propellant grain having an ogive frontal section, an enlarged central portion, a concavely-shaped nozzle section and an enlarged rear, said rocket body being of a predetermined length and a variety of predetermined diameters, said largest diameter being at said central portion and said rear, and means operably connected to said propellant body for igniting said rocket whereby utilization of the surrounding air stream forms a nozzle area between said nozzle section and said air stream permitting the burning of said propellant body from the outside-in.

4,170,876
METHOD AND APPARATUS FOR CONTROLLING A PRESS PLUNGER SYSTEM

Herbert R. Dits, Adlerring 23, D-6612 Schmelz, and Egon A. J. Bauer, St. Johanner Strasse 46, D-6602 Saarbrücken-Dudweiler, both of Fed. Rep. of Germany

Filed Jun. 9, 1977, Ser. No. 805,145
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625884
Int. Cl.[2] B60T 13/00
U.S. Cl. 60—547 R 4 Claims

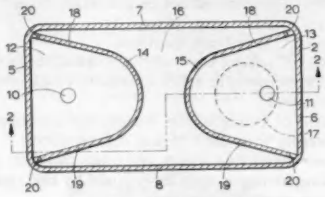


1. A hydro-pneumatic drive system for use in a press having a press plunger comprising:
- a pneumatic cylinder assembly adapted to be connected to a pressure gas source;
- a hydraulic pressure transformer, the input member of which is connected to the output member of the pneumatic cylinder assembly and the output member of which is connected to the press plunger;
- a first control valve means for connecting the pressure gas source to the pneumatic cylinder assembly;
- a second control valve means for connecting the working space of the pressure transformer to a pressure liquid pump;
- an actuating member mounted for common movement with the output member of the pressure transformer; and
- a plurality of position transducers arranged along the path of the output member of the pressure transformer, each of said position transducers being adapted to effect either opening or closing of at least one of the control valve means in accordance with the position of said output member.

4,170,877
RESERVOIR ASSEMBLIES FOR VEHICLE BRAKING SYSTEMS

John F. Pickering, West Midlands, England, assignor to Girling Limited, Birmingham, England

Filed Sep. 20, 1976, Ser. No. 724,533
Claims priority, application United Kingdom, Sep. 23, 1975, 38896/75
Int. Cl.[2] F15B 7/10
U.S. Cl. 60—592 12 Claims



1. A reservoir assembly for a tandem master cylinder of an hydraulic braking system, said reservoir assembly comprising a container for hydraulic fluid defined by a continuous wall, said wall including opposed upper and lower ends, opposed front and rear ends and side portions connecting said ends, the upper end of said wall having a filler opening adapted to be closed by a removable cap, partition means dividing the container into separate compartments, said lower end of said wall having spaced outlet ports for connection to separate pairs of recuperation and compensation ports of a tandem master cylinder, said partition means comprising at least one rigid baffle extending between said side portions of said continuous wall from one of said front and rear ends of said wall towards the other of said ends, passage means between said continuous wall and said baffle, and including a portion permitting limited transfer of fluid between said compartments past said baffle, said baffle being shaped such that the lateral horizontal width of one of said compartments generally decreases in a direction towards the other of said compartments over substantially the whole of the length of said one compartment in the longitudinal direction, said passage means being constructed and arranged such that when said container is installed in a vehicle and the brakes are applied transfer of fluid through said passage means from one of said compartments to another is limited to a minimum amount sufficient to prevent any resultant fluid level displacement during said brake application from uncovering one of said outlet ports.

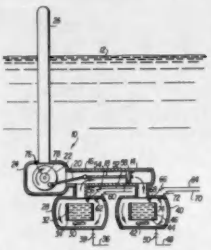
4,170,878
ENERGY CONVERSION SYSTEM FOR DERIVING USEFUL POWER FROM SOURCES OF LOW LEVEL HEAT

Charles E. Jahnig, 5 Auldwood La., Rumson, N.J. 07760

Filed Oct. 13, 1976, Ser. No. 732,050
Int. Cl.[2] F03G 7/04
U.S. Cl. 60—641 33 Claims

1. A method of energy conversion which comprises alternately contacting a confined gas with relatively warm liquid to

expand said gas and with relatively cool liquid to contract said gas to thereby produce a pressure differential under conditions



wherein the working gas is expanded to a volume greater than that which would result from the change in temperature alone and producing work by means of said pressure differential.

4,170,879

METHOD AND SYSTEM FOR UTILIZING WASTE HEAT GENERATED IN THERMAL ELECTRIC POWER STATIONS

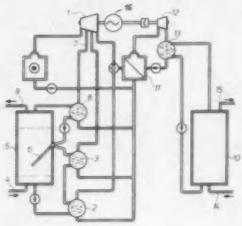
Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of Hofener Weg 35-37, D 7141 Aldingen, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 803,952

Claims priority, application Austria, Jan. 14, 1977, 205/77

Int. Cl.[2] F01K *17/02, 3/00*

U.S. Cl. 60—648 **8 Claims**



1. A method of producing heat for an area heating system remote from a thermal electric power station, the latter generating waste heat at different temperatures depending on the electrical load supplied by the power station at any one time, wherein water returned to the power station from said remote area heating system is first subjected to said waste heat which is generated at a relatively low temperature, said water is thereafter stored and later heated further by means of waste heat generated by said power station at a higher temperature and then fed back to said heating system.

4,170,880

WINDOW TYPE AIR CONDITIONER WITH SAND AND DUST PRECLUSIVE MEANS

Kwong-Li Lou, 8-2, Ln. 227, Nan-Men Rd., Tainan, Taiwan (700)

Continuation-in-part of Ser. No. 767,677, Feb. 11, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,636

Int. Cl.[2] F25D *23/12;* **E06B** *7/02*

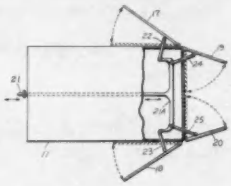
U.S. Cl. 62—262 **15 Claims**

1. In a window air conditioner having a radiator and a fan compartment, the improvement comprising:

a case, having an outer case rear portion and an outer case front portion, enclosing said radiator and said fan compartment, said outer case rear portion having a plurality of identical elongated casing ventilation passageways for admitting outside air into said casing, each of said passageways separated by a distance equal to the width of said elongated passageway;

a ventilation shield member movably mounted on said outer casing, said shield member having a plurality of shield ventilation passageways for admitting outside air through said shield member, each of said shield ventilation passageways corresponding to a particular casing ventilation passageway and comparably dimensioned relative thereto; and,

moving means for manually moving said shield member relative to said outer case rear portion from a first position in which said shield member blocks said casing ventilation



passageways to a second position in which said shield and said casing ventilation passageways overlap, said shield member moving said distance between adjacent ventilation passageways from said first to said second position, said moving means including an operating handle mounted at said outer case front portion;

whereby ventilating air enters said casing through said shield and said casing ventilation passageways when said shield member is in said second position, said shield member closing said casing to outside air, and in the event of windy weather precluding sand and dust from blowing into said air conditioner, when said shield member is in said first position.

4,170,881

METHOD OF AND APPARATUS FOR THE CONCENTRATION OF CRYSTALLIZABLE LIQUID

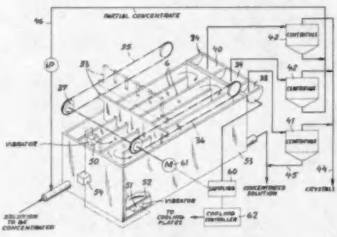
Udo Lang, Munich; Franz Gruber, Bruhl; Satish Anand, Deisenhofen, and Wilhelm Lehmer, Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 803,116

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625297

Int. Cl.[2] B01D *9/04*

U.S. Cl. 62—538 **10 Claims**



1. A process for the concentration of a solution by freezing crystals of a solvent therefrom, said process comprising the steps of:

passing said solution between at least two heat exchange surfaces in a direction transverse to the action of gravity to freeze crystals from said solution and permit said crystals to accumulate by gravitational movement along said path;

periodically displacing said surfaces by the delivery of energy thereto from a source outside said solution to impart relative vibratory movement to said solution and said surfaces; and

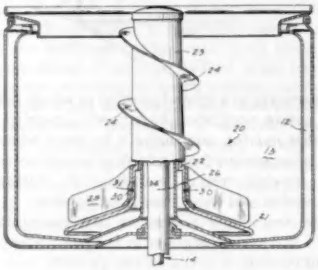
recovering the accumulated crystals from the liquid along said path, the recovery of the crystals from the solution along said path being effected in dependence upon the concentration of the liquid adherent thereto.

4,170,882

AGITATOR HAVING VANES ADJUSTABLE TO PROVIDE DIFFERENT STROKE LENGTHS

Robert A. Brenner, St. Joseph, and Victor W. Cuthbert, Sodus, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 19, 1977, Ser. No. 861,822
Int. Cl.[2] D06F *13/06*
U.S. Cl. 68—133 **14 Claims**



14. For use in a vertical axis washing machine,

an agitator having relatively movable upper, middle and lower portions including

a common driving means,

and lost motion means interconnecting said middle portion and said drive means to selectively vary the relative strokes of such middle portion with respect to the other upper and lower portions.

4,170,883

PRINTING OF PATTERN DESIGNS WITH COMPUTER CONTROLLED PATTERN DYEING DEVICE

George C. Varner, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 686,900, May 17, 1976, Pat. No. 4,116,626.
This application Apr. 28, 1978, Ser. No. 900,991
Int. Cl.[2] D06B *1/02, 11/00*
U.S. Cl. 68—205 R **2 Claims**

1. A system for printing first and second different patterns on textile material, comprising:

(a) means for moving the material in a path of travel;

(b) a plurality of gun bars spaced apart in succession along the path of travel of the material, each gun bar having dyestuff to apply on the material in accordance with pattern data;

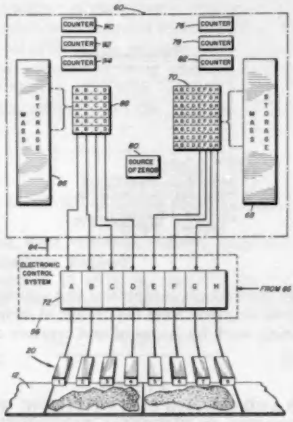
(c) first storage means for storing pattern data for the first pattern;

(d) second storage means for storing pattern data for the second pattern;

(e) third storage means for storing pattern data for both the first and second patterns, said gun bars being controlled by data in said third storage means to apply dyestuff on the material;

(f) means for periodically generating a signal to request that pattern data be transferred to said third storage means; and

(g) means, responsive to said signal, for transferring data from said second storage means to said third storage means for a first predetermined number of successive gun bars beginning with the first gun bar, and then transferring data from said first storage means to said third storage



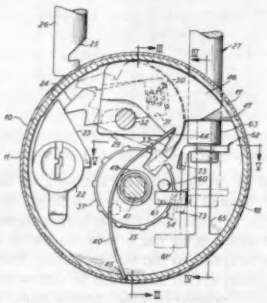
means for a second predetermined number of successive gun bars subsequent to said first predetermined number.

4,170,884

PERMUTATION CONTROLLED PADLOCK

Everett L. Calegan, Homewood, Ill., assignor to Junkunc Bros. American Lock Company, Crete, Ill.

Filed Feb. 24, 1978, Ser. No. 881,011
Int. Cl.[2] E05B *37/10*
U.S. Cl. 70—21 **7 Claims**



1. In a permutation padlock of the type having an outer casing and an inner casing generally conforming to said outer casing, in which the casings have coextensive side walls having parallel spaced aligned shackle-guiding and receiving openings therein,

a U-shaped shackle slidably guided in said openings and having a long leg and a shorter leg having a latch bolt receiving locking notch therein,

said outer casing having a wall forming a front cover for the padlock,

a tumbler spindle carried by said inner casing and extending above said front wall of said outer casing,

a dial post pivotally movable about said tumbler post,

a dial and knob on said dial post and operable to turn said dial post,

a driver tumbler within said casing on said tumbler post and turned upon turning movement thereof,

said driver tumbler having a plurality of upsetter lugs extending radially therefrom and having a driver extending

axially therefrom and radially offset from the center thereof,

driven tumblers on said tumbler spindle having driver members extending axially from opposite sides thereof,

said tumblers each having an outwardly opening slot therein,

spring means encircling said spindle and biasing said tumblers into engagement with each other,

a rocker assembly pivoted within said casing and having a latch bolt slidably mounted therein and biased to lockingly engage said locking notch and having a tongue extending therefrom engageable with said slots when aligned,

the improvements comprising:

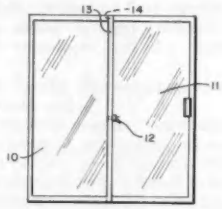
a one-piece upsetter loosely mounted on the long leg of said shackle and guided for rectilinear movement along the casing and having one arm adapted to engage a driver pin on the innermost of said tumblers to upset said tumblers upon release of the shackle from the latch bolt and a second arm adapted to move the last number of the combination dial away from the position dialed to accommodate opening of the padlock.

4,170,885

SLIDING DOOR LOCK

Calvin Q. Lundgren, Rte. 4, Box 620 G, Chico, Calif. 95926

Continuation of Ser. No. 697,714, Jun. 21, 1976, abandoned.
This application May 22, 1978, Ser. No. 907,871
Int. Cl.[2] E05B *65/08*; E05C *13/00*
U.S. Cl. 70—97 **24 Claims**



1. A locking device for locking sliding doors having bypassed first and second members where at least one of said members translates parallel to a plane of relative translation between said members, where said first member includes a first support, said second member includes a second support, and where said supports are positioned in close proximity when said members are translated to a position for locking, comprising:

a locking element carried on said first support parallel to said plane of relative translation,

locking means carried by said second support, said locking means slidably engagable with said locking element for locking said locking element and said locking means when said supports are in close proximity, thereby locking said members, said locking means and said locking element including means for unlocking said locking element and said locking means, said locking element including arm means for engaging said locking means to lock said members when said supports are in close proximity.

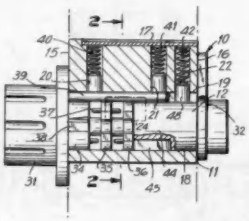
4,170,886

NUMERICAL COMBINATION REPLACEMENT FOR CYLINDER LOCKS

Lloyd S. Cowen, 816 Leeds Dr., N. Bellmore, N.Y. 11710

Filed Jun. 12, 1978, Ser. No. 914,486
Int. Cl.[2] E05B *37/08*
U.S. Cl. 70—302 **1 Claim**

1. As a new article of manufacture, a device for replacing a conventional door cylinder lock housing and plug comprising: a cylindrical housing having an outer diameter corresponding to that of the housing it replaces, said housing having a principal longitudinal axis, a through bore parallel to and laterally offset from said axis, and a longitudinally extending channel parallel to and communicating with said through bore; an elongated locking bar normally positioned within said channel, resilient means urging said bar from said channel into said through bore; a permutation plug element including a main shaft supported for rotation within said through bore, an operating knob fixed to a first outer end of said shaft, a plurality of combination tumblers mounted for relative rotation upon said shaft, each tumbler having a peripheral notch therein and pins



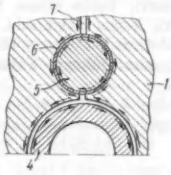
projecting parallel to said shaft for the transmission of motion from tumbler to tumbler; a lock operating member, one portion of which is mounted upon said shaft and disposed within said through bore, and having a corresponding peripheral notch disposed at an inner end of said through bore, said lock operating member including a portion on an inner end thereof for communicating with an existing latch; whereby, upon the dialing of a correct combination resulting in alignment of the notches in said tumblers and said lock operating member, said locking bar is urged into engagement with said notches to permit the transmission of movement from said knob to said lock operating member for the operation of said existing latch.

4,170,887

INDUCTOR FOR WORKING METALS BY PRESSURE OF PULSATING MAGNETIC FIELD

Mikhail I. Baranov, Kharkov, U.S.S.R., assignor to Kharkovsky Politekhnichesky Institut, Kharkov, U.S.S.R.

Filed Aug. 10, 1977, Ser. No. 823,421
Int. Cl.[2] B21D *26/19*
U.S. Cl. 72—56 **3 Claims**



1. An inductor for working metals by the pressure of a pulsating magnetic field, comprising:

a magnetic field concentrator having a cylindrical surface;

an insulating slot provided in said concentrator;

a winding arranged on said cylindrical surface of said concentrator and inducing eddy currents in said concentrator;

said concentrator having a surface upon which are concentrated said eddy currents for inducing eddy currents in metal being worked;

an opening wider than said insulating slot provided in said concentrator and extending axially along said insulating slot, close to said surface of said concentrator upon which are concentrated said eddy currents which induce eddy currents in the metal being worked;

a conducting compensation rod overlapping said insulating slot and accommodated in said opening; and

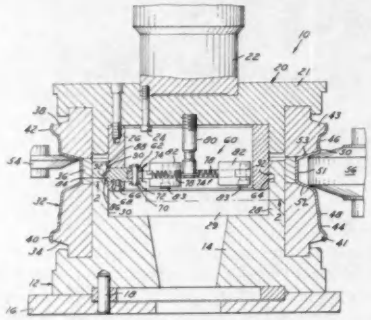
means for insulating said conducting compensation rod from said magnetic field concentrator.

4,170,888

APPARATUS FOR SPIN-FORMING WHEEL RIMS

John H. Golata, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Jun. 30, 1978, Ser. No. 920,650
Int. Cl.[2] B21D *22/16*
U.S. Cl. 72—82 **9 Claims**



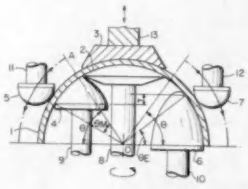
1. An apparatus for spin-forming wheel rims and including rotatable head and tail stock sections axially reciprocable with respect to each other between open and closed positions, die means carried by said head and tail stock sections and adapted in said closed position of said sections to define a selected wheel rim contour, and forming means disposed externally of said head and tail stock sections and adapted to cooperate with said die means for forming a wheel rim of said contour during rotation of said sections, the improvement comprising locking means carried by one of said head and tail stock sections and responsive to centrifugal forces generated during corotation of said sections to lock said one section to the other of said sections in said closed position.

4,170,889

METHOD AND APPARATUS FOR ROLL-FORMING AN END PLATE

Tateo Tanimoto, Saeki; Yukio Hiasa, Hiroshima; Hidehiko Tsukamoto, Saeki; Tetsuo Ichikizaki, Hiroshima; Akihiro Shindo, Saeki, and Akira Wakayama, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1978, Ser. No. 913,693
Claims priority, application Japan, Jun. 8, 1977, 52-66775
Int. Cl.[2] B21D *22/16*
U.S. Cl. 72—85 **4 Claims**



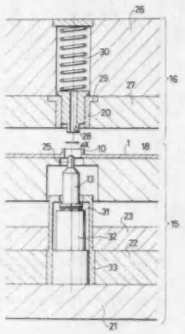
1. A method for roll-forming an end plate, characterized by the steps of placing a raw material disc between outer die means and inner die means, said outer die means consisting of a top outer forming die that can be vertically moved by a drive source and can be freely rotated and at least a pair of left and right outer forming rolls adapted to move along predetermined moving paths, said inner die means consisting of a top inner forming die held at a predetermined position that can be driven in rotation by a drive source, and a middle inner forming roll and a bottom inner forming roll both of which are freely rotatable; depressing said outer die means against said inner die means with said raw material disc clamped therebetween; and moving said pair of outer forming rolls along said moving paths so as to press said raw material disc against said middle inner forming roll and said bottom inner forming roll, respectively, one of said outer forming rolls being moved within an effective forming range of said middle inner forming roll, while the other being moved within an effective forming range of said bottom inner forming roll, and the effective forming ranges of said middle and bottom inner forming rolls, respectively, being partly overlapped with each other, whereby said raw material disc may be formed into a desired configuration defined by any suitable surface of revolution.

4,170,890

PUNCH AND DIE ASSEMBLY FOR USE IN THE PRODUCTION OF HEAT EXCHANGER FINS

Toyoo Kojima, Tokyo, Japan, assignor to Hidaka Engineering Company, Limited, Tokyo, Japan

Filed Jul. 13, 1978, Ser. No. 923,937
Claims priority, application Japan, Apr. 7, 1978, 53-40227
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—359 **9 Claims**



1. A punch and die assembly for use in the production of heat exchanger fins comprising:

a fixed lower tool holder including an elongated ironing punch having the same dimension as a predetermined flanged aperture, said ironing punch being loosely mounted in and supported by said tool holder such that the upper part of said ironing punch can slightly move horizontally with respect to said lower tool holder,

a movable upper tool holder having an elongated die matching said ironing punch,

an elongated guide rod coupled to movable with said upper tool holder whereby the longitudinal axis of the lower end of said guide rod is always coincidental with the axis of the die,

a spring normally urging said guide towards said lower tool holder,

a cylindrical bore end provided in either the upper end center of said ironing punch or lower end center of said guide rod,

a cylindrical projected end positioned in the other end center and adapted to be matchingly received in said bore, and

a retainer ring arranged between said ironing punch and a punch receiver, whereby said ironing punch and said guide rod are guided and cooperate with each other through said spring allowing the horizontal movement of

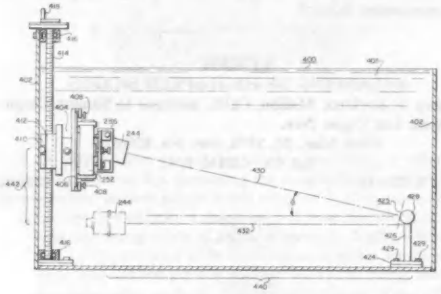
said ironing punch during operation of said punch and die assembly.

4,170,891

POSITIONING CALIBRATION APPARATUS FOR TRANSDUCERS EMPLOYED IN NUCLEAR REACTOR VESSEL INSPECTION APPARATUS

Hans J. Elsner, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1977, Ser. No. 805,546
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—1 R **6 Claims**



1. Apparatus for use in positionally calibrating ultrasonic transducers movably mounted in an assembly therefor, said apparatus comprising:
(a) a tank capable of holding fluid therein;
(b) mounting means, movably mounted in said tank for securing a transducer and the transducer mounting therein;
(c) means for moving said mounting means cooperatively coupled thereto; and
(d) a base, a relatively infinitely large reflecting surface and a relatively infinitely small reflecting surface mounted in said tank, a predetermined distance from said mounting means, said distance being selected to be greater than the distance required to place said reflecting surfaces without the "near field" of the transducer beam.

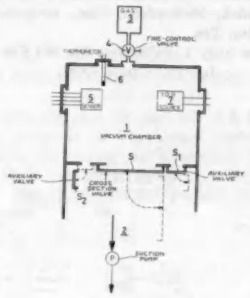
4,170,892

METHOD OF AND APPARATUS FOR THE ANALYSIS OF GASES

Eduard Bailitis, Aachen, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,066
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720300
Int. Cl.[2] G01N *31/00*
U.S. Cl. 73—23 **23 Claims**

1. A method of analyzing a gas comprising the steps of:
(a) feeding the gas to be analyzed into a first zone of known volume and permitting the gas in said zone to escape in a Knudsen flow through a first cross section into a second zone at a predetermined pressure;
(b) permitting the gas flow into and from the first zone in step (a) to reach a first steady state;
(c) measuring a parameter of the gas in said first zone at said first steady state;
(d) spontaneously changing the flow cross section through which said gas escapes from said first zone upon attainment of said first steady state and permitting the gas flow into said first zone and through the changed cross section to reach a second steady state;
(e) measuring said parameter of the gas at said second steady state; and
(f) deriving from said measurements values of the difference between the measurements at said steady states and the gradient of the measured value upon the spontaneous change in the cross section, the molecular weight of the



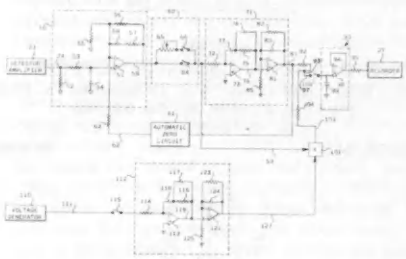
gas and the mean molecular velocity thereof being functions of said difference and gradient.

4,170,893

SLOPING BASELINE COMPENSATION FOR A CHROMATOGRAPHIC ANALYZER

Louis D. Kleiss, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 19, 1977, Ser. No. 862,065
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—23.1 **7 Claims**



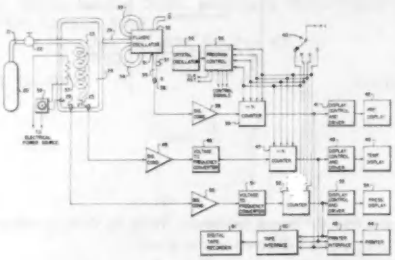
5. A method for integrating a first analog output signal having a varying voltage in time comprising the steps of:
integrating said first analog output signal over a period beginning at time t_1 and ending at time t_2 and establishing a first signal representative of the results of the integration of said first analog output signal;
correcting said first signal if the voltage level of said first analog output signal at said time t_1 does not equal the voltage level of said first analog output signal at said time t_2, said step of correcting said first signal comprising:
establishing a second signal representative of the time period t_2-t_1;
establishing a third signal representative of the difference between the voltage level of said first analog output signal at said time t_1 and the voltage level of said first analog output signal at said time t_2;
multiplying said second signal and said third signal to produce a fourth signal; and
algebraically summing said fourth signal and said first signal to produce a fifth signal representative of a corrected integration of said first analog output signal.

4,170,894

MEANS, EMPLOYING A FLUIDIC OSCILLATOR, FOR DETERMINING THE DENSITY OF GAS

Joseph E. Zupanick, Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,536
Int. Cl.[2] G01N *9/00*
U.S. Cl. 73—30 **3 Claims**



1. A method for determining the density of a gas sample comprising the steps of:

(A) measuring the pulse repetition frequency of an astable fluidic oscillator while the gas sample flows through the oscillator

(B) under the same pressure and temperature conditions employed in step (A), measuring the pulse repetition frequency of the astable fluidic oscillator while air flows through the oscillator,

(C) dividing the pulse repetition frequency obtained in step (A) by the pulse repetition frequency obtained in step (B); and

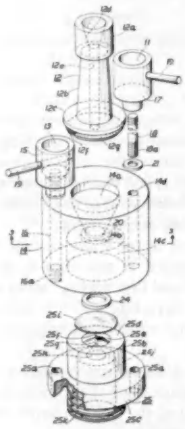
(D) squaring the result obtained in step (C).

4,170,895

ONCOTIC PRESSURE MEASUREMENT CELL

Gilbert L. Kliger, 1201 Lindley Ave., Philadelphia, Pa. 19141

Filed Feb. 27, 1978, Ser. No. 881,705
Int. Cl.[2] G01N *13/04*
U.S. Cl. 73—64.3 **10 Claims**



1. An oncotic pressure measurement apparatus comprising:

(a) an upper chamber having a single opening toward the top thereof through which a sample to be analyzed may be passed into the interior of said chamber and an opening formed in the base thereof and also having a plurality of first passageways formed therein which extend substantially the entire length of said chamber,

(b) a lower reference chamber having a second passageway formed therein toward the top thereof which communicates with the interior of said lower chamber,

(c) a plurality of elongated rigid members whose lower ends are fixed to said reference chamber and which are adapted to pass through corresponding ones of said first passageways, and

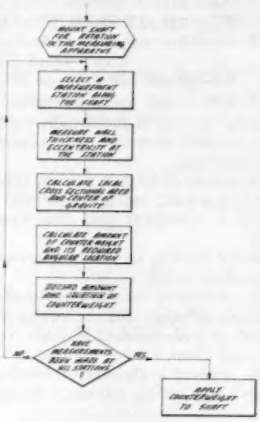
(d) means adapted to engage the upper ends of said rigid members when passed through said passageways for producing a predetermined downward pressure of said upper chamber without any appreciable rotary component of movement thereof.

4,170,896

BALANCING OF HIGH-SPEED SHAFTS

Gregory J. Korkosz, Malibu, Calif., assignor to Summa Corporation, Las Vegas, Nev.

Filed Mar. 20, 1978, Ser. No. 890,610
Int. Cl.[2] G01M *1/32*
U.S. Cl. 73—66 **15 Claims**


SELECT A MEASUREMENT STATION ALONG THE SHAFT
MEASURE WALL THICKNESS AND ECCENTRICITY AT THE STATION
CALCULATE LOCAL CROSS SECTIONAL AREA AND CENTER OF GRAVITY
CALCULATE AMOUNT OF COUNTERWEIGHT AND ITS REQUIRED ANGULAR LOCATION
NO
YES
APPLY COUNTERWEIGHT TO SHAFT

1. A method for balancing tubular shafts typically having varying wall thickness and eccentricity at different stations along the shaft, comprising the steps of:

(1) mounting the shaft for rotation about an axis parallel to a reference plane surface;

(2) rotating the shaft about the axis;

(3) positioning at a selected station along the shaft both an X_1 electrical transducer for measuring the separation between the reference plane surface and the external surface of the shaft and an X_1-X_2 electrical transducer for measuring the thickness of the wall of the shaft along a line extending normally from the reference plane surface to the axis of the shaft at the selected station, the X_1 and X_1-X_2 transducers continuously measuring as the shaft is rotated and continuously converting the measured quantities into electrical signals as the shaft is rotated;

(4) applying the electrical signals generated by the transducers to a computation circuit adapted to determine from the electrical signals generated at the selected station the required amount of counterweight and its required angular location around the shaft to balance the shaft at the selected station;

(5) repeating the steps (3) and (4) at each remaining selected station along the shaft until the steps have been performed at all of the selected stations;

(6) applying lengthwise along the shaft at the required angular locations a strip of counterweight material providing

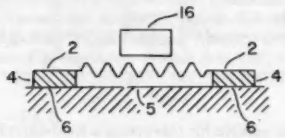
the required amount of counterweight to counterbalance the selected stations of the shaft.

4,170,897

DISPLACEMENT MEASURING SENSOR

Clarence O. Babcock, 5 S. Flower, Lakewood, Colo. 80226

Filed Apr. 22, 1977, Ser. No. 790,013
Int. Cl.[2] G01B *17/00*; G01L *1/10*
U.S. Cl. 73—778 **8 Claims**



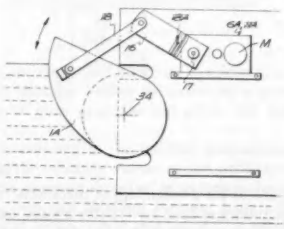
1. A displcement measuring device including a vibratory helical wire sensor for measuring the longitudinal displacement between two anchor points in the range of 1–15%, comprising:
(a) a wire coil of helical shape with at least one circular turn, said coil being made of material having a high yield stress and being provided with two ends to which a tensile stress of at least 10,000 p.s.i. is applied, said ends being made of the same wire as the coil, the displacement range of said sensor being 1–15% of said sensor length, said sensor having a flexibility of at least 3.4 times the flexibility of straight wire sensors, based on the same gage lengths and tensile forces applied,
(b) means for anchoring the ends of said sensor to said anchor points,
(c) plucking means for said wire, and
(d) means for reading a vibrational characteristic of the wire.

4,170,898

APPARATUS FOR CREATING SURFACE WAVES IN A BODY OF LIQUID

Stephen H. Salter, 143 E. Trinity Rd., Edinburgh EH53PP, Scotland

Filed Aug. 18, 1976, Ser. No. 715,403
Claims priority, application United Kingdom, Aug. 20, 1975, 34546/75; Aug. 6, 1976, 13840/76
Int. Cl.[2] G01M *10/00*
U.S. Cl. 73—148 **14 Claims**



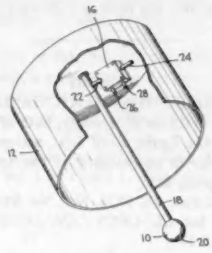
1. Apparatus for creating surface waves in a body of liquid comprising a liquid displacer, means for mounting said displacer at a pre-determined depth below the surface of the body of liquid, for back and forward movement, motive means for moving the liquid displacer back and forth to create the waves in the body of liquid, means for sensing the reaction force of the liquid on the displacer, means in an electrical circuit for generating a signal related to said reaction force, means included in said electrical circuit for controlling the movement of the displacer with said signal to make the displacer behave as a damped system in which said reaction force on the displacer and its motion are substantially in phase, whereby the displacer can not only create waves but also absorb waves impinging on said displacer.

4,170,899

METHOD AND APPARATUS FOR MEASURING GAS FLOW SPEED

Tetsuya T. Fujita, Chicago, Ill., and Alfred J. Bedard, Jr., Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Apr. 11, 1978, Ser. No. 895,340
Int. Cl.[2] G01W *1/00*; G01F *1/34*
U.S. Cl. 73—189 **9 Claims**



1. Apparatus for measuring the speed of a gas stream by direct pressure measurement, said apparatus comprising:
first pressure sensing means including a body having a surface of revolution and an axis of revolution;
means defining a pressure sampling port in said surface centered on said axis of revolution whereby said port registers a first negative pressure when the apparatus is exposed to a gas stream flowing in planes substantially perpendicular to said axis by acceleration of the gas flow stream lines over said surface, said negative pressure being a function of the speed of flow of the gas stream irrespective of the general direction of gas flow in said planes; means adjacent said first sensing means for producing a second negative pressure different from said first pressure when exposed to said gas stream, second sensing means for sensing said second pressure and pressure responsive means for receiving pressure signals from each said sensing means and producing an output dependent on the difference between said signals, said output being a function of the speed of the gas stream wherein said means for producing a further negative pressure comprises a hollow cup-like member having a base and side wall means defining an opening opposite said base, the apparatus further including mounting means projecting from said opening, said body being carried by said mounting means externally of said cup-like member.

4,170,900

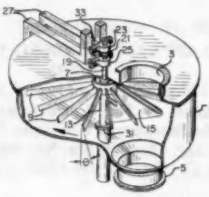
ROTARY SAMPLER FOR PARTICULATE MATTER

Kenneth Y. Ozawa, 760 I. St. SW., Quincy, Wash. 98848

Filed Jan. 20, 1978, Ser. No. 870,945
Int. Cl.[2] G01N *1/20*
U.S. Cl. 73—424 **8 Claims**

1. Apparatus for sampling a moving stream of material including a body defining a material intake and exit port, a movable sample taking chute, which includes a hollow collector tube and means for controlling the frequency of sample taking means wherein the improvement comprises an impeller including a plurality of angular blades and further including at least one hollow blade which defines a sample taking chute;
the impeller response to impingement of the moving stream

on the angular blades to move the chute through an entire cross-section of the moving stream;



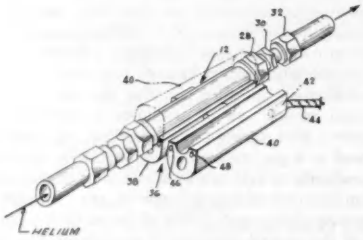
the chute defining a hollow passage to direct material entering the chute into the hollow collector tube.

4,170,901

SORPTION TUBE ATMOSPHERIC SAMPLING SYSTEM

James P. Conkle; William W. Lackey, both of San Antonio, and Charles L. Martin, Lytle, all of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 15, 1978, Ser. No. 915,710
Int. Cl.[2] G01N *1/24, 15/00*
U.S. Cl. 73—421.5 R **5 Claims**



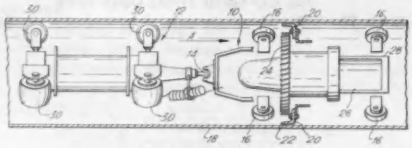
1. A sorption tube atmospheric sampling system comprising a removable sorption tube, means operably connected to said sorption tube for drawing a preselected amount of air through said sorption tube in order to trap within said sorption tube contaminants in the atmosphere, means operably connected to said drawing means for regulating the amount of air drawn through said sorption tube, means operably connected to said regulating means for monitoring the amount of air drawn through said sorption tube, and a thermal desorption block for use with said sorption tube during removal and testing of said contaminants contained within said sorption tube, said sorption tube being in the form of a hollow, elongated element having a preselected tubular configuration made of a rigid, substantially non-corrosive material, said preselected tubular configuration conforming to the interior configuration of said thermal desorption block, said hollow, tubular-shaped element having a high polished interior surface, a fitting being attached to each end of said element, a coupling being removably mounted within each of said fittings, each of said couplings containing therein a stainless steel screen, a sorbent material being located within said hollow, tubular-shaped element between said screens for trapping therein said contaminants found in the atmosphere, a vacuum coupling being connected to at least one of said couplings containing a screen therein, said vacuum coupling being removably securable to said means for drawing a preselected amount of said air through said sorption tube during said contaminant trapping procedure and to a spectrometry analysis apparatus when said sorption tube is in position within said thermal desorption block during said contaminant removal and testing procedure.

4,170,902

PIPELINE INSPECTION VEHICLES

William Pallan, Newcastle upon Tyne, England, assignor to British Gas Corporation, London, England

Filed May 18, 1978, Ser. No. 907,349
Int. Cl.[2] F16L *55/00*
U.S. Cl. 73—432 R **8 Claims**



1. A pipeline vehicle for traversing a fluid-carrying pipeline comprising a vehicle body, a plurality of wheels mounted on the body for engagement with the wall of the pipeline, at least one hydraulic displacement device drivingly coupled to a respective wheel and connected in a hydraulic circuit, and means controlling flow in the hydraulic circuit thereby to control the speed of the vehicle, wherein each hydraulic displacement device is a hydraulic motor supplied with hydraulic fluid by a pump on the vehicle and wherein the pump is driven by a turbine which extracts power from the fluid in the pipeline flowing past the vehicle.

4,170,903

BALANCING APPARATUS FOR BLADE SETS FOR A CUTTER

Günter Wanke, Kuppenheim, Fed. Rep. of Germany, assignor to Georg Wanke, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,795
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734260; Sep. 3, 1977, 2739740
Int. Cl.[2] G01M *1/36*
U.S. Cl. 73—480 **21 Claims**

1. An apparatus for a balancing of blade sets for a cutter, the blade sets including at least two cutter blades, each of which is provided with a carrier bore having a hexagonal profile, the cutter blades being provided with at least one clamping set containing at least one compensating ring, the at least one compensating ring is held to be rotatable about an axis of rotation of the carrier bore of the cutter blades and has a mass distribution which is asymmetrical with respect to the axis of rotation of the carrier bore, characterized in that a holding fixture means is provided for holding the cutter blades and the at least one clamping set, a support means is mounted on a fixed supporting surface and has said holding fixture means mounted thereon, a substantially horizontally extending rotary axle is mounted in said support means, said holding fixture means is mounted so as to be rotatable about an axis of rotation of said

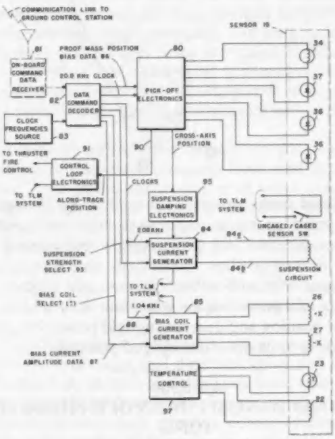
rotary axle, means are provided on said holding fixture means for adjusting said holding fixture means so as to accommodate carrier bores having differing hexagonal profiles, and in that a marking stop means is attached to said support means, said marking stop means is adjustable in a radial direction with respect to the rotary axle.

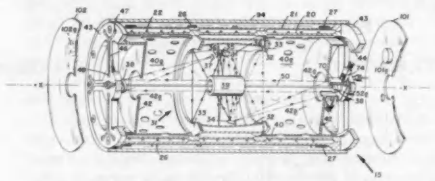
4,170,904

SINGLE-AXIS DISTURBANCE COMPENSATION SYSTEM

Robert E. Fischell; Glen H. Fountain; Frederick F. Mobley, all of Silver Spring, and Albert C. Sadilek, Elkridge, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 12, 1977, Ser. No. 859,355
Int. Cl.[2] B64G *1/10*
U.S. Cl. 74—5.6 E **10 Claims**





1. In a system for controlling an artificial earth satellite equipped with thruster means to move at a predetermined velocity along a pure gravitational orbit, the improvement comprising,

an enclosure attached to the satellite substantially in alignment with the velocity vector of the orbiting satellite,

an electrically conductive proof mass means disposed within said enclosure and shielded thereby from external non-gravitational forces while said satellite is orbiting,

said enclosure having interior surfaces disposed symmetrically relative to said proof mass means and forming an equipotential surface to shield said proof mass from electrostatic forces,

means for generating a controllable eddy current suspension force on said proof mass means to suspend said proof mass means on a reference axis substantially aligned with the velocity vector of the orbiting satellite,

means for generating a controllable eddy current biasing force on said proof mas means in either direction along said reference axis to position said proof mass means along said axis,

thermal control means for maintaining a constant temperature within said enclosure to keep constant the electrical resistivity of said proof mass means to eddy currents and thereby also the reaction of said proof mass means to said suspension and biasing forces,

means for detecting the position of the proof mass means along said axis, and

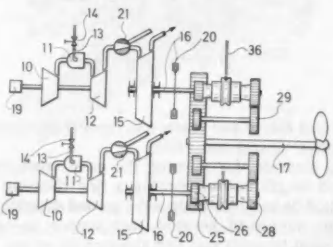
thruster control means responsive to said position detecting system for accelerating/decelerating said satellite to maintain a substantially constant position relative to said proof mass means, whereby said satellite also follows a purely gravitational orbit.

4,170,905

PROPULSION PLANT INCLUDING A GAS TURBINE AND A REDUCTION GEAR

Lars T. Collin, Mölndal, Sweden, assignor to Collin Consult AB, Sweden

Continuation-in-part of Ser. No. 667,341, Mar. 16, 1976, Pat. No. 4,051,679, which is a continuation of Ser. No. 595,228, Jul., 1975, abandoned, which is a continuation of Ser. No. 422,845, Dec. 7, 1973, abandoned. This application Aug. 31, 1977, Ser. No. 829,537
Claims priority, application Sweden, Dec. 8, 1972, 16003/72
Int. Cl.[2] F16H *37/06, 3/08*
U.S. Cl. 74—661 **1 Claim**



1. A propulsion plant including a propulsion shaft, a gas turbine having a rotor and an output shaft, means mounting said output shaft for rotation in opposite directions, means for supplying motive fluid to the turbine rotor, and a reversing gear means for connecting the turbine output shaft to the propulsion shaft, said reversing gear means including a first gear rotatable with the propulsion shaft, second and third gears each meshing with said first gear, said second and third gears being of smaller diameter than said first gear, intermeshing fourth and fifth gears, said fifth gear being axially aligned with said third gear and having a permanent driving connection therewith, said second gear being axially aligned with said fourth gear, said second gear having a bore formed therethrough, the turbine output shaft passing through said bore, a two-part clutch means associated with said output shaft intermediate said second and fourth gears, a first part of said clutch means being connected to the output shaft for rotation therewith, means for axially displacing a second part of said clutch means into engagement with either of said second or fourth gears to form a driving connection between said output shaft and said second or fourth gears, respectively, and a brake for said turbine output shaft.

4,170,906

WIRE SKINNING MACHINE

Jean P. Lefebvre, St. Hubert, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 31, 1977, Ser. No. 847,414
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.51 **10 Claims**

1. For a cable comprising a plastic outer sheath and a num-

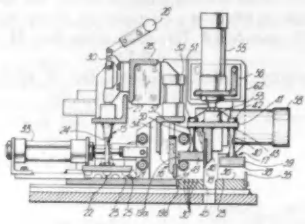
ber of inner conductors each insulated one from the other with a plastic coating, said cable having an axis along the length of the cable, a machine for skinning said insulating coating from ends of said inner conductors comprising in combination;

a base plate and a pair of support members mounted on said base plate, a support member at each end of said base plate;

said base plate including a plane work surface area disposed centrally on said base plate;

means for clamping said cable to including a ribbed clamping surface forming part of said plane work surface and a ribbed clamping member slidably supported on and positioned between said support members, in opposition one to the other and extending transversely to the cable length, the ribs of said clamping surface and said clamping member offset to provide a serpentine clamping area;

a fanning member for fanning said inner conductors into a single layer of conductors disposed in approximately parallel relationship on said plane work surface and parallel to said axis of said cable, said fanning member slidably supported on said base plate;



shearing members for shearing the inner conductors to a desired length and comprising a first shearing member mounted on said base plate and a second shearing member slidably supported between said support members for movement towards said first shearing member;

cutting members for cutting into said insulating coating at a predetermined distance from said ends to define end portions of said insulating coating and comprising a first cutting member mounted on said base plate and a second cutting member slidably supported between said support members for movement towards said first cutting member;

means for moving said clamping means relative to said cutting members to slide said end portions of insulating coating from said inner conductors in a direction parallel to said plane work surface along a line parallel to the axis of said cable.

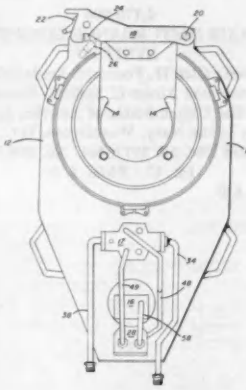
4,170,907

DOOR INTERLOCK FOR AN OPEN-HEAD POWER TONG

Gregory D. Cathcart, Houston, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed May 1, 1978, Ser. No. 901,671
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.11 **5 Claims**

1. In a power tong for use in make-up or break-out of a drill pipe or the like in drilling operations including a bifrucated frame structure having a central opening and a side opening which communicates with said central opening, drill pipe engaging and gripping means rotatably supported for movement into and out of said central opening, power means operably associated with said drill pipe engaging and gripping means for rotating said drill pipe about the axis of said central opening, and a door mounted on said frame structure in proximity to said side opening and moveable between a closed position to close said side opening during operation of said power tong and an open position to open said side opening to permit a drill pipe to pass therethrough to said central opening, an improved door-interlock mechanism for ensuring said door is in its closed position during operation of said power means, thereby providing safety to the operating personnel as well as protecting the tong from possible damage which may occur in operating the tong while the door is open, said improved door-interlock mechanism comprising:



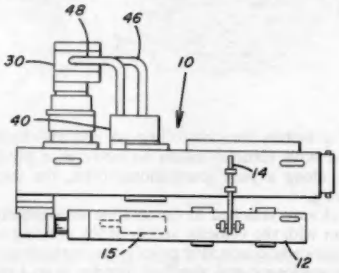
means on said frame structure for controlling the operation of said power means in response to the closed position of said door wherein said door engages said control means and the opened position of said door wherein said door is disengaged with said control means, said control means actuating said power means when said door is in its closed engaged position and deactuating said power means when said door is in its open disengaged position.

4,170,908

INDEXING MECHANISM FOR AN OPEN-HEAD POWER TONG

John E. Peveto, and Gregory D. Cathcart, both of Houston, Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed May 1, 1978, Ser. No. 901,670
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.11 **4 Claims**



1. In a drilling apparatus for use in making-up and breaking-out of a drill string or the like by respectively connecting and disconnecting an upper pipe with a lower pipe having an open-head power tong including a frame having a central opening and a throat leading to said central opening from outside said frame, a ring having a side opening and rotatably mounted on said frame within said central opening, pipe engaging jaws mounted on said ring for movement into and out of said central opening to respectively engage and disengage a pipe disposed within said central opening, said ring when rotatably moved in a first direction causes said jaws to engage a pipe and rotate same in a make-up operation and when rotatably moved in a second opposite direction causes said jaws to engage and rotate

a pipe in a break-out operation, said jaws when engaged with said pipe and rotated with said ring in one of said first and second directions being operably to disengage from said pipe upon thereafter being rotated with said ring in the other of said first and second directions, and hydraulic means including a hydraulic motor for rotatably driving said ring in said first and second directions, a source of hydraulic fluid pressure and a hydraulic control valve selectively moveable between first and second positions for directing fluid to said motor to respectively rotate said ring in respective first and second directions and moveable to a third position for obstructing the flow of fluid to said motor to stop same, an improved indexing mechanism for automatically aligning said throat of said frame with the side opening of said ring to facilitate lateral movement of pipe into and out of said central opening, said improved indexing mechanism comprising:

(a) a source of pneumatic pressure;

(b) a pneumatic index valve moveable between open and closed positions and having a plunger moveable between corresponding ring contacting and ring non-contacting positions, said plunger being moved to its ring contacting position when said index valve is moved to its open position and said index valve being moved to its closed position when said plunger is moved to its non-contacting ring position;

(c) a switch actuable to a first position for providing communication of pneumatic pressure from said source to said index valve which causes said index valve to be moved to its open position, said switch actuable to a second position for relieving said penumatic pressure on said index valve;

(d) a penumatic direction valve moveable between first and second states, said direction valve being set in its first state when said ring moves in its first direction and being set in its second state when said ring moves in its second direction;

(e) a pneumatic assist cylinder in communication with said index valve through said direction valve and is moveable between first, second, and third positions, said assist cylinder moveable to one of its first or second positions in response to penumatic pressure communicated from said index valve which, in turn, causes said hydrauulic control valve to move to one of its corresponding first or second positions, said assist cylinder also being moveable to a third position in response to relief of said pressure from said index valve which in turn causes said hydraulic control valve to move to its corresponding third position;

(f) said pneumatic direction valve, when set in its first state and upon actuation of said switch to its first position providing pneumatic pressure communication from said index valve to said assist cylinder valve so as to move the latter to its second position, causing said hydraulic control valve to move to its second position and, in turn, rotation of said ring in its second direction, said pneumatic direction valve, when set in its second state, and upon actuation of said switch to its first position, providing pneumatic pressure communication from said index valve to said assist cylinder so as to move the latter to its first position, causing said hydraulic control valve to move to its first position, and, in turn, rotation of said ring in its first direction; and

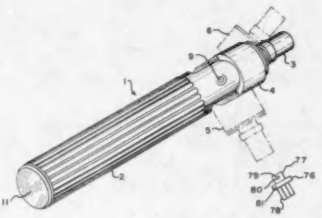
(g) a cam on said ring and engageable with said plunger when the latter is at its ring contacting position to cause said plunger to move to its non-contacting position, said cam being located on said ring in reference to said side opening in the latter such that when said cam engages and moves said plunger from its contacting to its non-contacting position said side opening is aligned with said throat of said frame whereby after termination of either a make-up or break-out operation and stoppage of said motor, actuation of said switch to its first position causes said index mechanism to align said side opening of said ring with said throat of said frame by (1) moving said index valve to its open position and thereby said plunger to its ring contacting position, (2) pneumatically moving said assist cylinder to one of its first or second positions, and thereby said hydraulic control valve to one of its corresponding first or second positions, which causes said ring to rotate in a direction opposite to that in which it rotated during said respective terminated operation and thereby causes said pipe engaging jaws to disengage said pipe, said rotation of said ring being terminated and said alignment achieved when said cam engages said plunger moving the latter to its non-contacting ring position which, in turn, moves said index valve to its closed position thereby relieving pressure from said assist cylinder and allowing the latter and said hydraulic control valve to move to respective third positions wherein said hydraulic motor is stopped and rotation of said ring terminated.

4,170,909

TOOL HOLDER

Theodore R. Wagner, 2590 S. Federal Blvd., Denver, Colo. 80219

Filed Sep. 23, 1977, Ser. No. 836,141
Int. Cl.[2] B25B *13/46*
U.S. Cl. 81—63.2 **34 Claims**



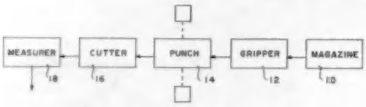
1. A tool holder for use in transmitting applied manual force to its held tool comprising a socket means, said socket means provided for accommodating a tool, socket control means holding said socket means and furnishing directional rotation for the said socket means and its tool upon use of the tool holder, a handle means, said handle means having the socket control means connected therewith and capable of maintaining an angular relationship with said control means for enhancing the application and transfer of force during the tool holder usage, a sleeve fixedly arranged within said socket control means, said sleeve having a series of retention means provided around its interior, said socket means being inserted within said sleeve in cooperating with said sleeve retention means for preventing a turn of the said socket means in one direction as during application of a force, while freely providing a reverse turn of the said socket means in preparation for the exertion of additional force during usage of the said combined tool holder and its held tool, fastening means cooperating within the socket control means for securing the said socket means within the same, said socket control means including a cylindrical member having a central cavity provided therein, said retention means sleeve being fixedly secured within the said member cavity, the series of retention means formed of the sleeve forming a ratchet, said socket means formed having an integral base portion, a pawl shiftably associated with said base portion and capable of movement into engagement with the said ratchet and retard socket means rotation at least in one direction, said base portion having an eccentrically transverse arranged slot formed therethrough and being of a size to accommodate the insertion of the said pawl therein, said pawl capable of shifting in opposing directions within the said formed slot, the shift of said pawl from one side and its engagement with the said ratchet preventing a rotation of the socket means in one direction, while a shifting of the said pawl to the other side and its engagement thereat with the said ratchet precluding a rotation of the socket means in an opposite direction, an adjustment means provided exposed upon the socket means above its

integrally formed base portion, whereupon a manipulation of the said adjustment means effects a shifting of the said pawl to one of the said sides of the base portion of the socket means, said socket means including a central channel axially arranged therethrough, a shaft provided within said channel, said adjustment means including a band, said band being fixed to said shaft, means operatively associated between the said shaft and pawl, whereby a pivot of the said band translates into a shift of the pawl to one of said sides of the socket means base portion and its fixation by means of its intermeshing with the control means ratchet.

4,170,910
ANGLE IRON CUTTING

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Division of Ser. No. 795,088, May 9, 1977, Pat. No. 4,106,380.
This application Oct. 27, 1977, Ser. No. 846,216
Int. Cl.[2] B26D *11/00*
U.S. Cl. 83—71 **6 Claims**



1. Apparatus for automatic punching and cutting of angle irons or the like comprising:

means for providing a supply of angle irons to be cut;

means for transporting said angle irons away from said supply means;

means for punching holes of predetermined size in an angle iron at a punching position, said means comprising a plurality of male dies, each of a different size, means for selecting one of said plurality of male dies for punching a hole in an angle iron at said punching position and power means for moving a selected male die to effect punching, a plurality of female dies for cooperation with said male dies, one corresponding to each of said male dies in size to effect punching of a hole in an angle iron of desired size and selecting means for automatically selecting the proper one of said plurality of female dies for cooperation with a selected male die, said selecting means comprising shaft rotatable about a horizontal axis having a plurality of arms: each arm having a female die associated therewith, a guide slot for receiving a face of an angle iron which face is not acted upon by a said male die, and a blank disposal slot allowing passage of blanks out of said arm; and power means for indexed rotation of said shaft to move the selected female die arm into cooperative position with a male die;

means for automatically determining the length of angle iron to be cut at a cutting position; and

means for cutting an angle iron at the cutting position to provide an angle iron of predetermined length.

4,170,911
LOG CUTTING APPARATUS

Thomas A. Ayers, and Peter T. Ayers, both of Sumter, S.C., assignors to Forest Products Industrial Designs, Inc., Sumter, S.C.

Filed Mar. 29, 1976, Ser. No. 671,587
Int. Cl.[2] B26D *7/02, 7/18*
U.S. Cl. 83—104 **21 Claims**

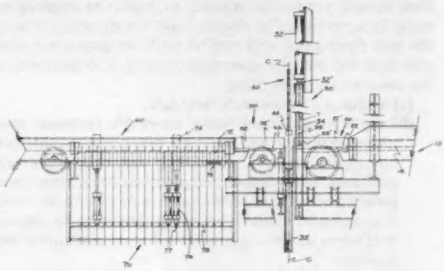
1. Improved log cutting apparatus comprising:

(a) first conveyor means for transporting logs to be cut;

(b) log clamp means located adjacent an end of said first conveyor means, said clamp means comprising a first bifurcated member located below a log to be cut and a second befurcated member located above a log to be cut, said first and second bifurcated members being moveable to clamp a portion of a log therebetween;

(c) power cutting means located adjacent said clamp means, said cutting means being moveable across said log to sever same;

(d) pivotal waste removal means located adjacent said power cutting means; said waste removal means lying beneath a log path of travel and being pivotal upwardly to remove cut log waste from the apparatus;



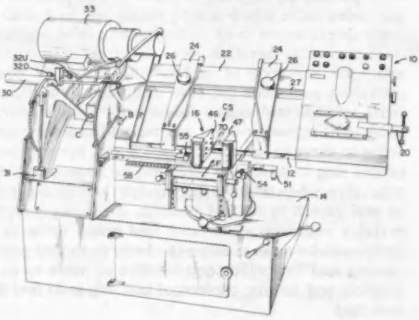
(e) second conveyor means located on an opposite side of said power cutting means to said first conveyor means; and

(f) a plurality of individual log stop means located along said second conveyor means and being individually actuatable to stop a log moving along said second conveyor means at a predetermined location to cut a predetermined length of log.

4,170,912
BAND SAW MACHINE

George N. Bliss, 1613 Emerald, Milton, Wash. 98354

Filed Aug. 18, 1977, Ser. No. 825,703
Int. Cl.[2] B23D *55/04;* B27B *13/04*
U.S. Cl. 83—268 **14 Claims**



1. A band saw comprising:

a base,

a cutting head,

an endless band saw blade mounted in said cutting head for lengthwise movement along a cutting plane,

first pivot means on said cutting head for pivoting the saw blade along said cutting plane for cutting a workpiece,

second pivot means for changing the angle of said first pivot means for varying the angle of said cutting plane so as to cut at any angle from vertical to horizontal,

means for holding the workpiece during said cutting,

said cutting plane when vertical being forward of said workpiece holding means, said workpiece holding means being rotatable about a vertical axis,

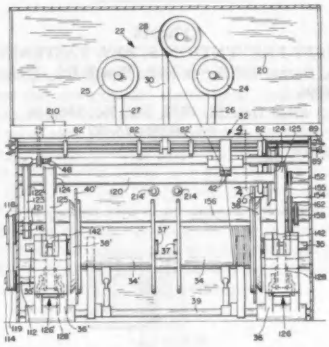
said blade when mounted for cutting in a vertical plane having a lower cutting run and an upper run, the lower run being twisted out of the plane of the upper run and the upper run being located forward of the workpiece holding means, and

said holding means including opposed jaws each having an upper surface and a forward surface, said cutting planes at extreme horizontal and vertical angles lying closely adjacent said upper and forward surfaces of said jaws, respectively, said second pivot means including a pivot member containing the pivot axis for varying said cutting plane angles, said pivot axis being located close to and upwardly and forwardly from the intersection of said upper and forward surfaces so that the varied cutting planes will at all times pass closely adjacent the upper and forward surfaces of the jaws regardless of the angle of the cutting plane.

4,170,913
STRAND CUTTING MECHANISM

David C. Hoddinott, N. Stonington, and Albert P. Brown, Gales Ferry, both of Conn., assignors to Crompton & Knowles Corporation, New York, N.Y.

Division of Ser. No. 822,751, Aug. 8, 1977, Pat. No. 4,111,376.
This application Mar. 13, 1978, Ser. No. 886,382
Int. Cl.[2] B26D 1/24
U.S. Cl. 83—441 **2 Claims**



1. A strand cutting mechanism comprising

(a) a cutter head having a generally V-shaped guide notch;

(b) a first cutting disc having a plurality of spaced recessed cutting edges disposed along its periphery and mounted for free rotation on one side of said guide notch and near its apex so that a portion of its periphery extends into said notch; and

(c) a second cutting disc having a plurality of spaced recessed cutting edges disposed along its periphery and mounted for free rotation on the other side of said guide notch and near its apex so that a portion of its periphery extends into the guide notch and overlaps with the periphery of said first cutting disc whereby a strand which is moved into said V-shaped notch is cut before it reaches the apex of said V-shaped guide notch.

4,170,914
CHEWING GUM CARRIER AND CUTTER

Vernon J. Carrier, 25830 Viana St., Lomita, Calif. 90717

Filed May 30, 1978, Ser. No. 910,363
Int. Cl.[2] B26D 1/34
U.S. Cl. 83—580 **4 Claims**

1. A chewing gum dispenser which comprises:

a rectangular box, said box having a top, a bottom, two sides, a front end and a rear end;

said box dimensioned to contain a plurality of sticks of chewing gum stacked one upon another;

said top having an elongated hole extending along the lengthwise dimension of said top;

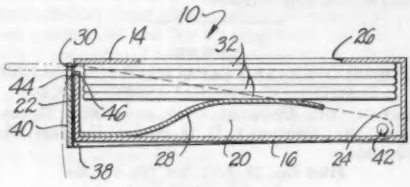
biasing means within the interior of said box urging said sticks of chewing gum against the interior side of said top such that a portion of the topmost stick of chewing gum is exposed through said elongated hole;

said front end of said box having a slot extending from one side to the other side adjacent to said top;

said slot being dimensioned such that a stick of gum can pass through said slot;

said front end including a movable combination cutting and sealing means;

said combination cutting and sealing means having a first position wherein said combination cutting and sealing means extends over said slot and seals said slot;



said combination cutting and sealing means having a second position wherein said slot is exposed;

said combination cutting and sealing means reversibly moving between said first position and said second position such that when said combination cutting and sealing means is in said second position and the uppermost stick of gum within the interior of said box is slid along the interior surface of said top by frictionally engaging said uppermost stick of gum by the user inserting a finger through the elongated slot and pushing said stick of gum through said elongated slot exposing a portion of said stick of gum, and said combination cutting and sealing means is moved from said second position to said first position, causing said stick of gum to be severed by said combination cutting and sealing means, one portion of said stick of gum remaining inside said box and the second portion of gum being dispensed to the user.

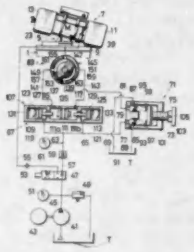
4,170,915
FEED CONTROL FOR HORIZONTAL BANDSAW MACHINES

Masao Sato, Hadano, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Feb. 28, 1978, Ser. No. 882,118
Claims priority, application Japan, Feb. 28, 1977, 52/20165
Int. Cl.[2] B26D 5/04
U.S. Cl. 83—800 **6 Claims**

1. In a horizontal bandsaw machine having a cutting blade operable at variable speeds, said cutting blade being carried on a head assembly which is movably mounted relative to a table for supporting the material to be cut, said head assembly being movable away from said table by means of a fluid-actuated mechanism which is fed with hydraulic fluid drawn by a pump from a fluid reservoir, said head assembly being movable towards said table by means of gravity at a rate controlled by the return flow of hydraulic fluid from said fluid-actuated mechanism to said fluid reservoir, the improvement comprising: first conduit means for connecting said pump to said fluid-actuated mechanism; second conduit means for connecting said fluid-actuated mechanism to said fluid reservoir; valve means in said second conduit means for controlling the rate of return fluid flow therethrough from said fluid-actuated mechanism to said fluid reservoir, said valve means being responsive

to both the operating speed of said cutting blade and to the fluid pressure in said second conduit means; and, manually



adjustable pressure control means in said second conduit means for varying said fluid pressure.

4,170,916

TOUCH OPERATED CAPACITIVE SWITCH FOR ELECTRONIC MUSICAL INSTRUMENTS

William L. Fritz, Cincinnati, Ohio, and Walter Munch, Ft. Thomas, Ky., assignors to D. H. Baldwin Company, Cincinnati, Ohio

Filed Jun. 23, 1977, Ser. No. 809,364
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **7 Claims**

1. In an electronic musical instrument of the type having a keyboard including a plurality of keys and circuit means for generating electrical signals, a touch operated capacitive switch mounted adjacent said keyboard of the instrument for altering at least one of the generated signals, said touch switch comprising a thin elongated laminated strip spanning a plurality of keys, said laminate having a non-conducting lamina sandwiched between a conducting touch electrode and a conducting guard electrode, means for attaching said switch nonconductively to the instrument with said guard electrode facing the instrument, said touch electrode and said guard electrode each having an electrical connecting means for connecting said touch electrode and said guard electrode to said circuit means, whereby the capacitance of the switch may be altered by touching said touch electrode to cause a change in the operation of said circuit means.

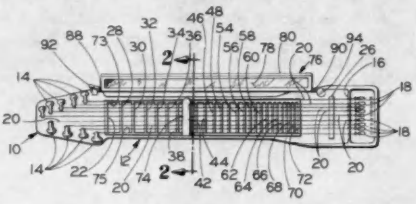
4,170,917

MIRROR ACCESSORY MEANS FOR STRINGED MUSICAL INSTRUMENT

Daniel C. Wheelock, Rte. #3, Cheboygan, Mich. 49721

Filed Sep. 21, 1977, Ser. No. 835,175
Int. Cl.[2] G10D *3/04*
U.S. Cl. 84—319 **14 Claims**

1. For use in combination with a musical instrument having fret board means, a plurality of frets situated along said fret board means, a plurality of musical strings situated generally above said frets and extending generally longitudinally along said fret board means, and a slide bar for contacting said strings at points in relationship to selected frets during playing of said instrument, reflector means positionable along one side of said fret board means and said strings to provide visual assistance to a player of said musical instrument in placing said slide bar on



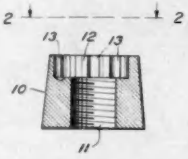
said strings directly above and in alignment with a particular selected fret, whereby said slide bar comprises reflector surface means effective for reflecting the image of said particular selected fret which is situated underneath said slide bar against said reflector means, and whereby said reflector means reflects said image to said player thereby enabling said player to position said slide bar on said strings directly above and in said alignment with said particular selected fret.

4,170,918

THEFT-PREVENTION SCREW FASTENING

William G. Burge, 955 Seven Hills Ranch Rd., Walnut Creek, Calif. 94596

Filed Oct. 28, 1977, Ser. No. 846,436
Int. Cl.[2] B25B *15/00*
U.S. Cl. 85—32 R **7 Claims**



1. A nut-manipulating means consisting of a wrench having a circular boss on one end thereof, a plurality of pins mounted on said boss in key and keyseat relationship therewith, said pins being spaced around the exterior curved surface of said boss in a random pattern, the longitudinal straight edges of the limits of the contiguous surfaces of that portion of said pins with the boss of said wrench being parallel and being substantially coincident with the plane of maximum resistance to longitudinal shear of said pins, said pins extending beyond the upper portion of said boss whereby transverse shear resistance is a further potential provision.

4,170,919

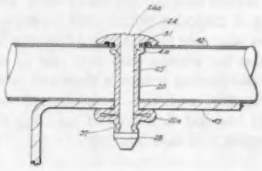
BLIND SPACER FASTENER

George Siebol, Orange, Calif., assignor to Olympic Fastening Systems, Inc., Downey, Calif.

Division of Ser. No. 796,538, May 13, 1977, Pat. No. 4,074,608, which is a continuation of Ser. No. 632,498, Nov. 17, 1975, abandoned. This application Oct. 31, 1977, Ser. No. 846,771
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—71 **1 Claim**

1. A spacer fastener for effectively joining a first member to a second member with a controlled space therebetween which

comprises: a main rivet sleeve having an enlarged sleeve head thereon to engage the outside of said first member and a free end removed from said sleeve head; a rivet pin having a shank with a constant diameter portion within said main rivet sleeve and having a pin head thereon engaging said sleeve free end, said rivet pin shank including a pull portion with gripping means thereon extending beyond said sleeve head, said main rivet sleeve having a bore throughout its length to initially receive said rivet pin with said pin head engaging said sleeve free end and said pull portion extending beyond said sleeve head; and axially spaced, external means for picking up the underside of said first member and the outside of said second



member, respectively, as said pin head is drawn against said sleeve free end towards said sleeve head, said external means comprising a first set of slots adjacent said sleeve free end and a second set of slots provided in said main rivet sleeve adjacent said enlarged sleeve head and spaced from said first set of slots, said main rivet sleeve being provided with weakened areas between the slots of said second set, whereby when said pin head is drawn against said sleeve free end towards said sleeve head a first configuration will be formed in the area of said second set of slots to engage said underside of said first member whereafter a second configuration will be formed to engage the said outside of said second member.

4,170,920

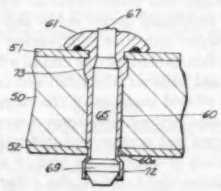
BLIND SPACER FASTENER

George Siebol, Orange, Calif., assignor to Olympic Fastening Systems, Inc., Downey, Calif.

Division of Ser. No. 796,538, May 13, 1977, Pat. No. 4,074,608, which is a continuation of Ser. No. 632,498, Nov. 17, 1975, abandoned. This application Oct. 31, 1977, Ser. No. 846,770

Int. Cl.[2] F16B *13/06*

U.S. Cl. 85—72 **2 Claims**



1. A spacer fastener for effectively joining a first member to a second member with a controlled space therebetween which comprises: a main rivet sleeve having an enlarged sleeve head thereon to engage the outside of said first member and a free end removed from said sleeve head; a rivet pin having a shank received within said main rivet sleeve and having a pin head thereon engaging said sleeve free end, said rivet pin shank including a pull portion with gripping means thereon extending beyond said sleeve head, said main rivet sleeve having a bore throughout its length which is configured so as to initially just nicely receive a major portion of the said shank; a portion of said main rivet sleeve towards said enlarged sleeve head being deformable to pick up the underside of said first member, said sleeve free end being deformable to pick up the outside of said second member, both deformations to take place as said pin head is drawn against said sleeve free end towards said sleeve head; an exterior step on said main rivet sleeve spaced from said sleeve free end and adapted to engage the upper side of said second member; and spaced means to effect said deformations, said spaced means comprising an interior ramp in said main rivet sleeve towards said enlarged sleeve head, a first pin ramp on said rivet pin in engagement with said sleeve interior ramp, and a second pin ramp on said pin head in engagement with said sleeve free end; whereby when said pin head is drawn toward said sleeve head said step engages the upper side of said second member and said first pin ramp forces said sleeve outwardly in the region of said sleeve interior ramp to form a first deformation protuberance on said main rivet sleeve to engage the underside of said first member, and said second pin ramp forces said sleeve free end outwardly to form a second deformation protuberance on said main rivet sleeve to engage the outside of said second member.

4,170,921

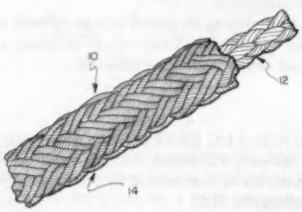
BRAIDED ROPE

George H. Repass, Marion, Mass., assignor to New England Ropes, Inc., New Bedford, Mass.

Filed Mar. 17, 1978, Ser. No. 888,144

Int. Cl.[2] D04C *1/12*

U.S. Cl. 87—6 **11 Claims**



1. A braided rope construction having a cover comprising a plurality of singles yarns formed from a plurality of filaments twisted together, said singles yarns twisted together to form a plurality of separate plied yarns, a plurality of said plied yarns longitudinally bundled together in substantially parallel, non-twist relation to form a strand, a plurality of said strands being braided together with each of the singles yarns therein being disposed at a helical angle that is equal and opposite to the helical angle of said plied yarns in said braid, whereby said singles yarns extend substantially parallel to the axis of said rope.

7. The method of making a braided rope construction comprising the following steps:

(a) twisting together a plurality of individual filiaments to form a plurality of singles yarns;

(b) twisting together a plurality of said singles yarns to form a plurality of plied yarns;

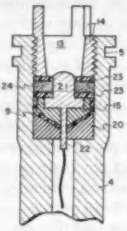
(c) laying a plurality of said plied yarns together in substantially parallel, non-twist relation to form strands; and

(d) braiding said strands together so that the helical angle of said plied yarns in said braid is equal and opposite to the helical angle of said singles yarns in their respective plied yarns, whereby said singles yarns extend substantially parallel to the axis of said rope.

4,170,922
IGNITOR

Gary L. Peterson, and Larry L. Liedtke, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 16, 1977, Ser. No. 833,852
Int. Cl.[2] F41F *1/04;* H01T *13/20*
U.S. Cl. 89—7 **13 Claims**



1. An ignitor for a liquid propellant gun having a bore comprising:

a bolt having a nose;

a center electrode having a rodlike portion, a domed end and a broadened end anchored in said bolt at said broadened end;

ring means for insulating said center electrode, surrounding and abutting the rodlike portion of the center electrode so that only the domed end is exposed to said bore;

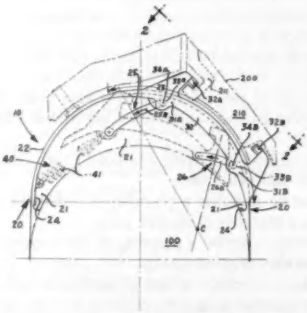
an outer electrode having a threaded portion anchored at one end in the bolt, abutting said ring means and surrounding said domed end of said electrode, said threaded portion extending beyond said domed end but not beyond said bolt nose; and

means for transmitting electrical energy to said center electrode and connected thereto so as to cause a spark between said center and outer electrodes.

4,170,923
LAUNCH LUG RETRACTOR ASSEMBLY

LeMoyne L. Kilmer, Florissant, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 17, 1978, Ser. No. 896,832
Int. Cl.[2] F41F *7/00*
U.S. Cl. 89—1.819 **3 Claims**



1. A missile launch lug retractor assembly, adapted for use in combination with a missile with which said assembly is integrated, and also adapted for concurrent use with an aircraft having a missile launcher with launcher hooks, from which hooks said integrated combination of missile and missile launch lug retractor assembly is supported, and from which launcher said integrated combination is launched, comprising:

a. an aerodynamically configurated housing having a cavity, and having an external surface with an opening therein and therethrough leading to, and interconnecting with, said cavity, and also having an internal surface with a first set and a second set of slots located therein, wherein each set of slots includes a first slot and a second slot that are identical and are oppositely disposed;

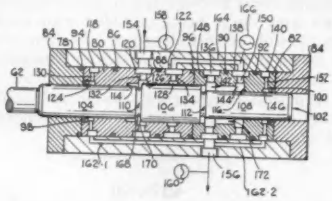
b. a generally arcuate-shaped lug fitting having a first end with a first lug and a first hold thereat and with a first pin in said first hole and extending therethrough, and also having a second end with a second lug and a second hole thereat and a second pin in said second hole and extending therethrough, wherein said first pin is slidably movable within said first set of slots, and said second pin is slidably movable within said second set of slots, and wherein said lug fitting is disposed within said cavity of said housing and also is movable through said opening in said housing;

c. and, means for biasing said first end of said lug fitting, wherein said biasing means is disposed within said cavity in said housing, and also is interposed between, and is connected to, said first end of said lug fitting and said internal surface of said housing.

4,170,924
HYDRAULICALLY POWERED PERCUSSIVE APPARATUS

Clive W. Hunt, Randburg, South Africa, assignor to Compair Sa (Proprietary) Limited, Transvaal, South Africa

Filed Jul. 1, 1977, Ser. No. 812,406
Claims priority, application South Africa, Jul. 15, 1976, 76/4220
Int. Cl.[2] F01L *21/02;* F01B *7/18*
U.S. Cl. 91—232 **8 Claims**



1. Hydraulically powered percussive apparatus comprising a cylinder structure having a bore, a combined spool valve and hammer reciprocable in the bore, the spool valve and hammer including a middle portion, a first end portion and a second end portion, the three portions being co-axial and cylindrical, and the middle portion being of larger diameter than either of the end portions with said first end portion of greater diameter than the second end portion, the bore being stepped to provide two annular surfaces and three portions which receive said portions of said combined spool valve and hammer, a first annular face between said first end portion and said middle portion, said first face bounding one end of a first annular zone which encircles said hammer, the other end of said zone being bounded by one of said surfaces of the stepped bore, a high pressure inlet to said first annular zone, a second annular face between said second end portion and said middle portion, said second annular face bounding one end of a second annular zone which encircles said hammer, the other end of said second zone being bounded by the other of said annular surfaces of the stepped bore, a low pressure outlet from said bore, means defining a fluid transfer path, said transfer path being placed alternately in communication with said inlet and outlet via said annular zones as said hammer reciprocates, said second face of the hammer which is exposed to the pressure subsisting in said transfer path having an area larger than the area of said first face which is continuously exposed to the pressure subsist-

ing at the inlet, the forces on these two faces acting in opposite directions.

4,170,925

BY-PASS VALVE FOR SERVO STEERING SYSTEMS

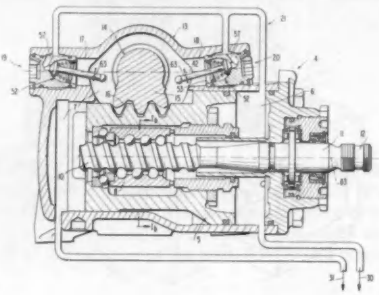
Klaus Katz; Wolfgang Pfundstein, and Reinhold Abt, all of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Apr. 5, 1977, Ser. No. 784,913

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615219

Int. Cl.[2] F15B *15/22, 9/10*

U.S. Cl. 91—400 29 Claims



1. A by-pass valve means in a servo-steering system, for cutting out working pressure, which by-pass valve means comprises:

a valve housing means including first valve-connection means,

second valve-connection means adapted to be essentially pressure-relieved, and

a valve seat means for a check valve means operatively connected between said first and second valve-connection means.

said check valve means including a closure member held in a normal position in which it closes off the first and second valve-connection means with respect to one another by spring means, and

said check valve means including its closure member further being operable to be actuated into a by-pass position in which it operatively connects the first and second valve-connection means with each other,

wherein the valve housing means, when in a completely assembled and operating condition, is exclusively movable in the rotational direction about a longitudinal axis of the valve housing means but is substantially immovably supported in all other directions thereabout the valve housing longitudinal axis,

wherein a longitudinal axis of the valve seat means is adjustable relative to a longitudinal axis of a steering shaft, and

wherein the valve seat longitudinal axis is non-coincidental but non-perpendicular with the valve housing longitudinal axis.

4,170,926

FLUTED CORE DISC BRAKE PISTON

John E. Emmett, Farmington, Mich., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

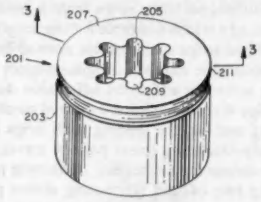
Continuation of Ser. No. 667,748, Mar. 17, 1976, abandoned.

This application Jan. 20, 1978, Ser. No. 871,041

Int. Cl.[2] F16J *1/00*

U.S. Cl. 92—212 10 Claims

1. In a disc brake caliper assembly comprising a disc brake cylinder housing and a plastic disc brake piston having a cylindrical outer surface and a hollow inner core having an open end and a closed end defining a substantially planar surface, the improvement wherein the piston has a fluted inner core surface extending from said open end to said substantially planar surface which has a cross-section circumference substantially



equal to the cross-section circumference of said cylindrical outer surface.

4,170,927

APPARATUS FOR DEPOSITING LENGTHS OF FOIL MATERIAL

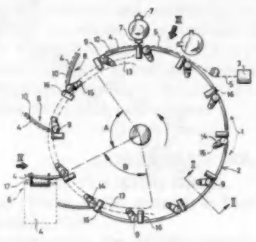
Leonard van der Meulen, Immeuble Saadi el Menzah, Appt. 22A, 6 éme Etage, Tour A, Tunis, Tunisia

Filed Feb. 22, 1978, Ser. No. 879,994

Claims priority, application Netherlands, Feb. 22, 1977, 7701897

Int. Cl.[2] B31B *21/14*

U.S. Cl. 93—33 H 6 Claims



1. An apparatus for depositing and batching lengths or sheets of foil material at a collecting station, particularly thermoplastic bags which are delivered by a production machine in an uninterrupted flow, which apparatus comprises a rotatably mounted supporting structure with a mantle face to which foil material is supplied in the course of the operation, said supporting structure being provided along its mantle face with unfoldable support members, each of which is arranged pivotally on an axis directed according to a generatrix of said mantle face, the support members in collapsed position substantially constituting the mantle face, while control means are provided for unfolding the support members in a first zone before the collecting station and for collapsing (re-folding) the support members in a second zone beyond this station.

4,170,928

APPARATUS FOR FABRICATING AND ASSEMBLING MULTI-CELL PARTITIONS

Marion W. Beasley, Bishopville; Harlan L. Carroll, Cassatt, and Hurley R. Brooking, Hartsville, all of S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 29, 1977, Ser. No. 855,809

Int. Cl.[2] B31D *3/04*

U.S. Cl. 93—37 R 21 Claims

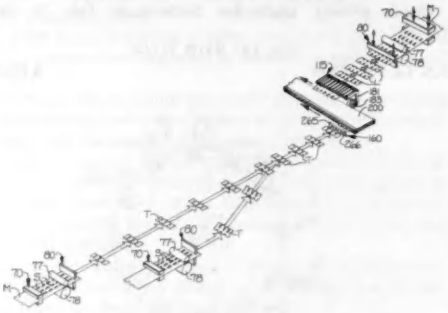
1. Apparatus for successively fabricating and assembling in a collapsed condition multi-cell partitions having a plurality of intermeshing, slotted, transverse and longitudinal strips for use in cartons, crates and the like, said apparatus being characterized by an improved construction providing for fabrication

and assembly of varying sizes and types of partitions at desired speeds for commercial operation, said apparatus comprising:

separate adjustable means for fabricating elongate transverse and longitudinal partition strips from a continuous length of material, of a width desirable for the length of the strips, into individual strips of adjustable desired height having a desired adjustable number of spaced-apart slots in each extending inwardly a desired adjustable distance from a leading edge thereof to define a desired number of flaps on the leading end and for feeding such strips in a generally horizontally-extending linear path of travel;

the separate means for fabricating transverse partition strips comprising two of said fabricating means positioned for feeding the respective cut and slotted transverse strips in generally superimposed horizontally-extending linear paths of travel, and conveyor means of a generally sideways Y-shaped configuration for receiving the fabricated partition strips from their superimposed paths of travel and for alternately merging the fabricated transverse partition strips into a single linear path of travel;

the separate means for fabricating longitudinal partition strips comprising a single one of said fabricating means positioned for feeding the respective cut and slotted longi-



tudinal partition strips in the generally horizontal linear path of travel in an opposing direction to the feed of the transverse partition strips; and

partition assembling means for successively receiving the leading cut and slotted edges of the transverse and longitudinal partition strips on respective opposite sides, for successively positioning strips of one of the series of fabricated transverse and longitudinal strips with successive flaps of each in vertically staggered and spaced positions, for successively positioning strips of the other of the series of fabricated transverse and longitudinal strips in successive vertically-staggered and spaced relationship with all of the flaps of each strip in one vertical plane, for conveying the thus positioned strips in a longitudinal direction generally transversely of the path of travel thereof through said fabricating means at a converging predetermined angle while separating a predetermined number of the strips into opposing groups of longitudinally-staggered strips and aligning the slots of the strips of opposing groups so that the opposing groups of strips will converge and intermesh as they are fed in the longitudinal path of travel for assembling the partitions in a collapsed condition.

4,170,929

APPARATUS FOR SETTING UP FOLDED CARTONS

James E. McDowell, 3109 Sidney Ave., Orlando, Fla. 32810

Filed May 24, 1977, Ser. No. 800,007

Int. Cl.[2] B31B *5/02*

U.S. Cl. 93—53 SD **18 Claims**

1. An apparatus for setting up folded cartons comprising in combination:

a frame;

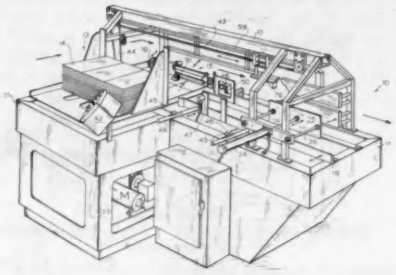
carton conveyor means for conveying set-up cartons thereon; said carton conveyor means being attached to said frame and having a carton discharge at one end of said carton conveyor means;

carton set-up means located at the other end of said conveyor means for setting up a folded carton fed thereto;

said carton set-up means having at least one vacuum cup for grasping folded cartons on each side during set-up of a carton;

folded carton magazine means located to one side of said set-up means for positioning a stack of folded cartons;

folded carton feed means for feeding folded cartons from said folded carton magazine means to said carton set-up means, said feed means having at least one suction cup for



grasping the bottom carton of a stack of folded cartons in said magazine and sliding means for sliding said suction cup and bottom folded carton from said folded carton magazine means to said carton set-up means and returning to engage the next folded carton in said magazine; and

vacuum pump and vacuum control system for controlling the vacuum on said carton set-up means vacuum cups and said feed means vacuum cup, said vacuum control system having at least one vacuum switch coupled to each said carton set-up means vacuum cup and to said feed means vacuum cup, said switch switching the vacuum between said carton set-up means and said feed means as said feed feed means delivers a folded carton to said carton set-up means whereby said switch simultaneously switches the vacuum back and forth from said carton set-up means to said feed means vacuum cup.

4,170,930

SCREEN FOR IMPROVING THE ENVIRONMENT OF A WORKPLACE HAVING A PLURALITY OF WORKING AREAS

Leif I. Lind, Storsjövägen 7, Johanneshov, Stockholm, Sweden (121 71)

Filed Dec. 8, 1977, Ser. No. 858,638

Claims priority, application Sweden, Dec. 9, 1976, 7613876; Apr. 15, 1977, 7704362

Int. Cl.[2] F24F *7/00, 13/00*

U.S. Cl. 98—40 D **12 Claims**

1. A screen having side surfaces for improving the environment of a workplace comprising:

frame means for defining a generally rectangular-shaped frame;

support means for detachably supporting said frame on a support surface;

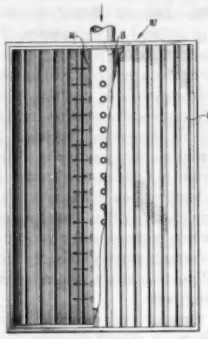
a perforated sheet connected to said frame to define one side surface of said screen;

a second sheet spaced from said perforated sheet and connected to said frame to define the other side surface of said screen, said sheets cooperating to define an enclosed space within said screen;

connection means associated with a portion of said frame adapted for connecting said enclosed spaced with an air-supplying line; and

said screen further comprising a perforated supply and distributing conduit for fresh air connected to said connection means and disposed within the enclosed space;

deflection means comprising the supply and distributing



conduit for fresh air having a number of radially disposed nozzles which project into the path of the flow of air and deflecting a number of equal and uniformly distributed part-flows departing in a direction substantially transverally of the direction of the main-flow in said conduit.

4,170,931

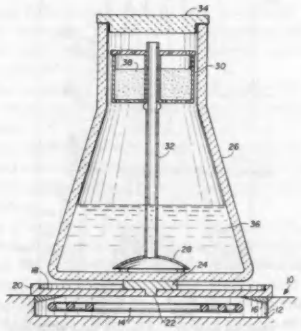
HEATING DEVICE FOR A PERCOLATOR AND METHOD OF USING THE SAME

Jack Fajans, 1133 Magnolia Rd., Teaneck, N.J. 07666

Continuation-in-part of Ser. No. 646,409, Jan. 2, 1976. This application Nov. 28, 1977, Ser. No. 855,295

Int. Cl.[2] A47J *31/44*

U.S. Cl. 99—312 **8 Claims**



1. A heating device for a percolator comprising:

(a) a plate member of heat conducting metal having a planar, annular surface;

(b) a spacer member of heat conducting metal having two spaced, oppositely directed, substantially planar and parellel faces, one of said faces being smaller than said surface; and

(c) cooperating locating means on a central portion of said surface and on the other face of said spacer member for substantially centering said spacer member on said surface.

4,170,932

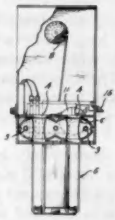
ELECTRONIC TOASTER CONTROL

Lionel Lalancette, 241 de la Bretagne St., Jonquière, Canada

Filed Jun. 21, 1977, Ser. No. 808,533

Int. Cl.[2] A47J *27/00*

U.S. Cl. 99—326 **7 Claims**



1. An electronic control assembly for a toaster including electric toasting elements on each side of a passage for receiving a slice of bread, a spring-loaded movable support for said slice of bread and a solenoid-controlled unlatching actuator device to unlatch said support and allow its movement under the action of said spring, said electronic control assembly comprising a temperature responsive transducer located in said passage adjacent said slice of bread and one of said electric toasting elements, a series-connected capacitor and resistor connected to said transducer and integrating the variable electric values of siad transducer as a function of the variable temperature to which it is subjected, and a pulse generator connected to said capacitor circuit and responsive to a minimum voltage to produce a pulse to actuate the solenoid of said unlatching device to unlatch said support.

4,170,933

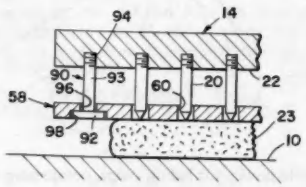
FAST COOKING GRILL

Jon F. Meamber, Yreka, Calif., assignor to Fast Food Fabricators, Inc., Redding, Calif.

Continuation-in-part of Ser. No. 732,542, Oct. 14, 1976, which is a continuation-in-part of Ser. No. 683,373, May 5, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 772,286

Int. Cl.[2] A47J *37/06, 43/18*

U.S. Cl. 99—349 **4 Claims**



1. A portable self-cleaning apparatus for cooking slabs of meat at an arbitrary position on a grill in a reduced time, comprising:

a generally flat heat conductive weighted member having a grill facing side which has a plurality of generally equal length heat conductive spikes extending therefrom towards said grill, said spikes each being directly connected at a first end thereof to said weighted member to extend from said grill facing side of said member and having a generally pointed portion extending towards said grill at a second end thereof, the weight of said weighted member being sufficient to force said spikes through slabs of meat positioned thereunder;

a heat conductive plate having a grill facing surface, being of a sufficient weight to eject said meat slabs and having a thickness less than the length of said spikes, said plate

having a plurality of holes therethrough corresponding to said plurality of spikes through which said spikes slidingly fit, said plate being freely slideable along said spikes and devoid of spring coupling to said weighted member such that said plate is urged toward said grill by gravity alone independent of said weighted member and does not affect said weighted member's forcing said spikes through said slabs; and

means for preventing said plate from moving a distance greater than the length of said spikes away from said weighted member while allowing said plate to assume a position with said grill facing surface adjacent the second ends of said spikes wherein said plate and said spikes contact said grill when said apparatus is placed directly on said grill, in which position

said grill directly conductively heats said plate and said spikes and further heats said weighted member through said spikes such that subsequent placement of said apparatus over said slabs causes said weighted member to urge said spikes through said slabs to cook said slabs partially from within, and causes said plate to contact the surface of said slabs remote from said grill to cook said slabs partially from above

said spikes being cleaned and any slabs of meat being cooked on said grill being removed from said spikes by the weight of said plate alone when said weighted member is moved away from said grill.

4,170,934

DEVICE FOR COMPRESSING CROP INTO BALES

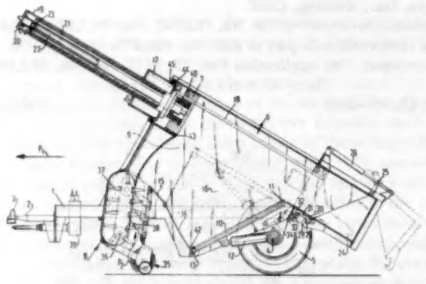
Pieter A. Oosterling, Nieuw-Vennep, and Adriaan Van Zweeden, Rijsenhout, both of Netherlands, assignors to Expert N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 811,174, Jun. 29, 1977, abandoned. This application Aug. 17, 1978, Ser. No. 934,427

Claims priority, application Netherlands, Jun. 30, 1976, 7607222

Int. Cl.[2] B30B *15/30*

U.S. Cl. 100—100 **18 Claims**



1. A mobile device for baling crops, comprising in combination:

a wheel-supported frame adapted to be travelled over the ground;

a generally horizontal compression chamber on said frame, said compression chamber having a discharge end portion of generally rectangular cross section and an intermediate portion of generally channel-shaped cross section smoothly merging with said discharge end portion such that the open side of the intermediate portion defines a side opening for the compression chamber;

a closure member pivotally carried by said discharge end portion normally closing same to define a well within which a compressed bale is to be formed;

a plunger having a cross section substantially filling said discharge end portion of the compression chamber and having a length much less than the length of said side opening of the compression chamber;

means for intermittently moving said plunger back and forth between a retracted position beyond said side opening remote from said discharge end portion and an extended position within said well;

an auxiliary space for receiving a crop to be transferred in preliminarily compressed condition through said side opening into the confines of said compression chamber, said space being defined by extensions of the parallel side walls of said intermediate portion, by a transverse wall portion extending between said extensions and projecting laterally away from said side opening of said compression chamber, and by a movable portion, said movable portion being mounted for movement between a retracted position in which said auxiliary space is formed and a closed position in which it defines, with said side walls of the compression chamber, an extension of said well, said movable portion closing off at least a major portion of said side opening when in its closed position;

feeder means for continuously feeding crop toward said transverse wall portion at a position laterally spaced from said side opening; and

drive means for moving said movable portion from its retracted position to its closed position prior to movement of said plunger to its extended position whereby crop is transferred laterally from said auxiliary space into preliminarily compressed condition within said compression chamber ahead of said plunger, said drive means returning said movable portion to its retracted position when said plunger is within said well whereby to reestablish said auxiliary space to accommodate the crop continuously fed into the device.

4,170,935

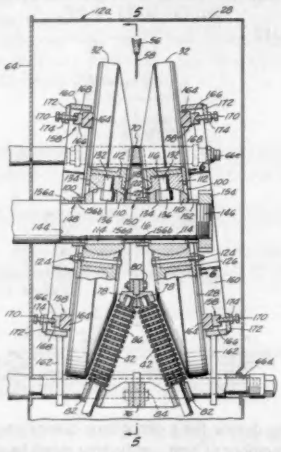
FRUIT JUICE EXTRACTION APPARATUS

Robert F. Rohm, Yorba Linda, and Ronald C. Bushman, Hacienda Heights, both of Calif., assignors to Brown International Corporation, Covina, Calif.

Filed Oct. 17, 1977, Ser. No. 842,549

Int. Cl.[2] B30B *3/04, 9/20*

U.S. Cl. 100—121 **28 Claims**



1. Fruit juice extraction apparatus, comprising:

a frame structure;

a pair of frusto-conical discs rotatably supported on said frame structure in generally confronting angular relation to provide a point of minimum peripheral spacing between the discs on one side, and a point of maximum peripheral spacing between the discs on a dimetral opposite side;

stationary means positioned between the frusto-conical discs and cooperative therewith to form separate paths for the

travel of the respective halves of cut fruit sections, each of said paths converging inwardly of the associated disc as well as circumferentially thereof in the direction of the disc rotation from a path inlet disposed adjacent said point of minimum spacing to a path outlet disposed adjacent said point of maximum spacing; and means for rotating said discs in unison.

4,170,936

METHOD FOR REMOVING WASTE

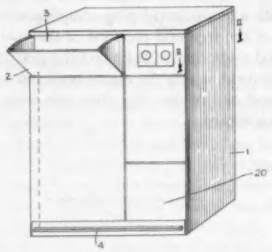
Walter Eck, Munich, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgerate GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 373,915, Jun. 27, 1973, which is a division of Ser. No. 263,851, Jun. 19, 1972, abandoned. This application Oct. 29, 1976, Ser. No. 737,012

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1971, 2130230; Jun. 18, 1971, 2130231

Int. Cl.[2] B30B *9/04*

U.S. Cl. 100—39 **1 Claim**



1. A method of disposing of household wastes into a central receiving system at predetermined intervals which comprises the steps of:

introducing household wastes into a disposal apparatus,

separating readily crushable non-bulky decomposable and non-decomposable constituents from bulk decomposable and non-decomposable constituents of said household wastes in said apparatus,

passing said separated non-bulky waste constituents to a separate container means in said apparatus,

passing said bulk constituents of said household wastes to a separate container means and compressing said constituents into a bag for disposal upon reaching a predetermined level in said container means,

holding the separated non-bulky constituents for discharge in said container means in said apparatus until a predetermined time,

introducing water into said container means in which the separated non-bulky constituents are held for discharge so as to float said constituents in said container means during said holding,

generating a signal in response to a timing means, said apparatus including means responsive to said signal for discharging said separated non-bulky constituents from said apparatus into a central receiving system, and

discharging the separated non-bulky constituents from said apparatus into said central receiving system at a predetermined time.

4,170,937

MINIATURIZED PRINTER CONTROL ASSEMBLY

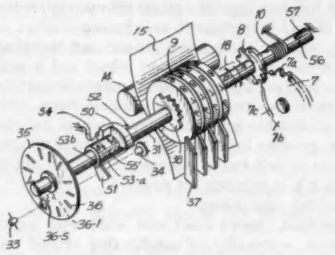
Norio Nakagaki, and Shigeru Sawada, both of Shiojiri, Japan, assignors to Shinshu Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 871,585

Int. Cl.[2] B41J *1/44*

U.S. Cl. 101—99 **12 Claims**

1. In a printer including a plurality of print rings having print characters circumferentially disposed therearound, said print characters being selectively positioned in a print position by rotation of each of said print rings in a first rotational direction from a stand-by position to a print position during a print cycle and rotational drive means including motor means adapted, in response to being energized, to rotatably drive said print rings at least from said stand-by position to a print position during each print cycle, the improvement comprising a detection means for detecting the rotary position of said print rings and for generating a character selection timing pulse for each of the available rotational positions of each said print ring during each print cycle, said rotational positions of each of said print rings corresponding to a print character circumferentially disposed about said print rings, print selection means associated with each of said print rings for selectively positioning each of said print rings at respective predetermined print positions during each print cycle, in response to said character selection timing pulses produced by said detection means being applied thereto, said detection means being constructed and arranged to produce a stand-by signal representative of each print ring being returned to a stand-by position at the end of each print cycle, said detection means further including shutter means for preventing said detection means from producing said stand-by signal until a first predetermined interval of time after the last of said character selection timing pulses is generated in each print cycle.



4,170,938

PRINTING HEAD FOR LABEL PRINTING MACHINE

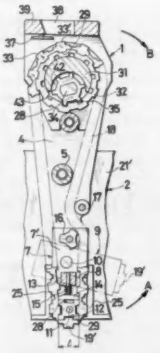
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Continuation of Ser. No. 669,816, Mar. 24, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,396

Claims priority, application Japan, Mar. 24, 1975, 50/034522; Jun. 25, 1975, 50/078610

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—111 **25 Claims**



1. A printing head for a label printing machine comprising:

a plurality of printing devices and a housing in which said printing devices are supported;

each said printing device comprising:

a pair of spaced apart, opposed, elongated frames; each said frame having a top, an upper portion near said top, a bottom and a lower portion near said bottom;

at least one rotation wheel pivotally attached at and located between said frame upper portions;

an H-shaped member having elongated side plates which are each pivotally secured intermediate their lengths to a respective said frame near said lower portion thereof; a lateral bar joining said side plates;

a respective rotation piece for each said rotation wheel; said rotation piece being pivotally attached to and being located between said side plates below said pivotal connection of said side plates to said frame;

a stamp belt for and passing around and engaging each set comprised of a said rotation wheel and a said rotation piece; first mutual engagement means on said belt and on said rotation wheel and said rotation piece, whereby said belt is rotatable with said rotation wheel and said rotation piece; printing types on said belt; a print direction at said bottom of said frame toward which each said type faces when it is in position for printing;

said housing comprising:

two opposed, spaced apart side walls with interior facing surfaces; a plurality of neighboring second engagement means each having the same dimension of elongation toward said print direction and being arrayed in a line transverse to said print direction on and along said side wall interior surfaces for engaging said side plates;

third engagement means connected with said side plates and engageable with said second engagement means;

said second and said third engagement means being so shaped and positioned that a plurality of said side plates and their respective said printing devices may be placed side-by-side in said housing in a line transverse to said print direction and said printing devices are emplaceable in and removable from said housing by motion generally along their said dimension of elongation and generally in said print direction.

4,170,939

IGNITION DEVICE FOR A PASSIVE RETENTION SYSTEM

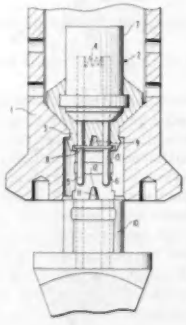
Peter-Matthias Hoheisel, Esslingen, and Gerhard Komander, Altbach, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 817,030

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633590

Int. Cl.[2] H01R *31/08*; F42B *3/18*

U.S. Cl. 102—28 S **15 Claims**



1. An ignition device for a passive retention system, comprising a housing means, an ignition unit including two plug pins arranged in the housing means, said plug pins having free ends projecting on one side out of a base means for purposes of slidingly receiving a plug-coupling means and being operatively connected on the other side with an incandescent bridge and surrounded thereat by an ignition mixture within a casing means, and protective contact means which protect the plug pins against electrostatic charges by short-circuiting the same prior to an emplacement of the plug-coupling means, characterized in that the protective contact means include a substantially U-shaped elastic clamp means for electrically conductively connecting the plug pins with each other with a non-inserted plug-coupling means, said elastic clamp means being adapted to be automatically opened during an insertion of the plug-coupling means in such a manner that the clamp means interrupts the contact between the plug pins only when the regular ignition circuit has already been closed, said elastic clamp means including two legs interconnected by a clamp back portion which abuts one of the two plug pins with a non-inserted plug-coupling means, each of the two legs terminates in a free end portion which abuts the other of the two plug pins with a non-inserted plug-coupling means, and in that at least one of the free end portions of the two legs is bent so as to surround said other of the two plug pins so as to produce a force component urging the clamp back portion into engagement with said one of the two plug pins with a non-inserted plug-coupling means.

4,170,940

PROJECTILE CHARGES

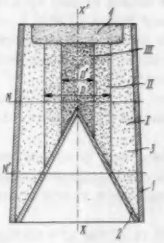
Michel Precoul, Paris, France, assignor to Societe d'Etudes, de Realisations et d'Applications Techniques, Paris, France

Filed Jul. 7, 1977, Ser. No. 813,694

Claims priority, application France, Sep. 27, 1976, 76 28964

Int. Cl.[2] F42B *1/02*

U.S. Cl. 102—56 SC **1 Claim**



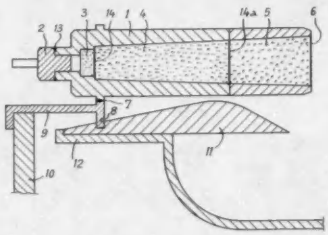
1. A generally cylindrical hollow shaped charge for an explosive projectile comprising a generally cylindrical jacket, and an explosive charge within the jacket, the charge having a generally conical, hollow depression in the front end of the charge, the charge being in the form of a plurality of coaxial layers, the innermost layer being a solid cylinder of explosive of relatively low power, the layer overlying the innermost layer being an annular layer having an explosive content more powerful than the innermost layer, and further annular layers, each having an explosive content more powerful than that of the adjacent inner layer, the outermost annular layer having the highest explosive content, the jacket further serving to elongate the jet by causing participation of a larger fraction of the generatrix of the conical depression remote from the front end of the charge.

4,170,941

IGNITER FOR A BLOCK OF PROPELLANT POWDER

Michel Reichard, Pessac, and Georges Krassoulia, Le Bouscat, both of France, assignors to Societe Europeenne de Propulsion, Puteaux, France

Filed May 18, 1977, Ser. No. 798,016
Claims priority, application France, May 25, 1976, 76 15836
Int. Cl.[2] F42C *19/08*; C06D *5/00*; F42B *13/28*
U.S. Cl. 102—202 7 Claims



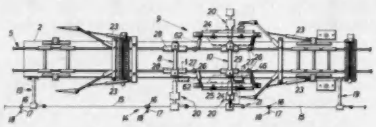
1. An igniter for a combustible powder block comprising a non-combustible receptacle, an ignition initiator arranged at one end of the said receptacle, and a solid charge placed inside said receptacle for thrusting on to the combustible parts of said powder block to produce ignition and including in succession from the end of the receptacle carrying the initiator a pyrotechnic ejection compound, a pyrotechnic ignition compound and reactive divided metals, wherein said reactive divided metals are capable of interreacting exothermally and of directly reacting with said combustible parts of said powder block, and wherein each successive element among said ejection compound, ignition compound and reactive divided metals has a slower burning rate.

4,170,942

MOBILE LEVELING, LINING AND BALLAST PACKING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Sep. 12, 1977, Ser. No. 832,438
Claims priority, application Austria, Oct. 4, 1976, 7379/76
Int. Cl.[2] E02B *35/08*
U.S. Cl. 104—7 B 8 Claims



1. A mobile leveling, lining and ballast packing machine for the non-stop correction of a track consisting of two rails fastened to ties resting on ballast and defining cribs therebetween, the ties having ends projecting laterally from the rails and points of intersection with the rails between the ends, the machine comprising the combination of

(a) an arrangement for compacting the ballast in a transverse direction from the ends of the ties towards the points of intersection and the cribs, the arrangement including an elongated vibratory plate extending along the tie ends at each side of the track and arranged cooperatively to compact the ballast therebetween to provide a region of compacted ballast extending transversely of the track,

(b) a fine correction track lifting and lining unit arranged in said region for holding the track in a selected position, the elongated vibratory plates being transversely adjacent the unit,

(c) a coarse correction track lifting and lining unit arranged forwardly of the fine correction unit,

(d) a first ballast plow and shaping unit arranged in association with the coarse correction unit for moving ballast transversely inwardly from the tie ends during operation of the coarse correction unit,

(e) a second ballast plow and shaping unit arranged rearwardly of the fine correction unit,

(f) an arrangement for compacting ballast against the tie ends mounted rearwardly of the second ballast plow and shaping unit,

(g) a stationary reference system determining a desired leveled and lined track position and controlling the track correction by the lifting and lining units, the reference system including

(1) a series of stationary marker posts mounted along the track,

(2) a tensioned reference wire supported on the posts and

(3) means on each of the posts for releasably holding the tensioned reference line and for adjusting the vertical and lateral position of the held reference line whereby respective sections of the reference line between successive ones of the posts may be readily mounted, dismounted and adjusted during the movement of the machine, and

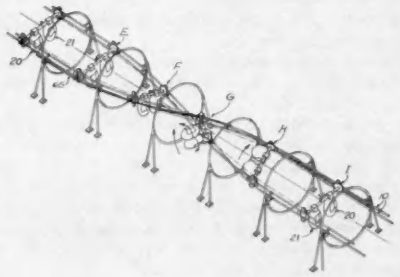
(h) a sensor unit associated with at least one of the correction units and cooperating with, and sensing, the tensioned reference line.

4,170,943

ROLLER COASTER ASSEMBLY

Prakash M. Achrekar, 1013 Tamarak Ave., Brea, Calif. 92621

Filed Aug. 1, 1977, Ser. No. 820,766
Int. Cl.[2] A63G *21/08*
U.S. Cl. 104—56 11 Claims



1. A roller coaster system comprising: a carriage assembly including a central cross member;

at least one rotatable shaft depending from said central cross member and in mechanical communication therewith;

a track of mobius configuration;

housing and gear means for mechanically coupling the central cross member to said rotatable shaft;

means for translating said carriage assembly including said central cross member along said track, the axis of said central cross member being substantially perpendicular to the axis of the track;

passenger seating means connected to said rotatable shaft;

whereby as the carriage assembly advances along the mobius track, and the central cross member is caused to rotate about the axis of the track from its initial position, the passenger seating means coupled to said rotatable shaft are also caused to translate about said track axis until their centers of gravity are located above the center of gravity of the central cross member thereby causing the passenger seating means to swing from the axis of the central cross member as well as to rotate axially.

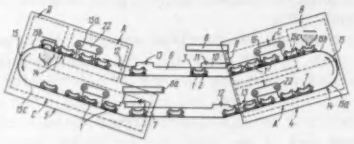
4,170,944
ARRANGEMENT FOR TRANSPORTATION OF CARGOES IN CONTAINERS

Evgeny I. Zhukov, Simferopolsky bulvar, 14, kv. 69; Viktor A. Kichulkin, Nagornaya ulitsa, 45, korpus 23, kv. 11; Vladimir Y. Tsernes, Kirovogradskaya ulitsa, 24, korpus 3, kv. 204; Alexandr B. Shekhel, Snaiperskaya ulitsa, 5, kv. 161; Naum Y. Kershenbaum, ulitsa Medikov, 6, kv. 38; Evgeny N. Senderov, Matveevskaya ulitsa, 10, korpus 2, kv. 25, and Oleg G. Ivoilov, ulitsa Perovskaya, 59, kv. 51, all of Moscow, U.S.S.R.

Filed Jun. 17, 1977, Ser. No. 807,634

Int. Cl.[2] B61B *13/10*

U.S. Cl. 104—138 R **6 Claims**



1. An arrangement for transportation of cargoes in containers along a closed loop track comprising:

at least two spaced handling stations, each of said handling stations having:

a zone of reception of containers comprising a portion of the track permanently communicating with atmosphere and inclined in the direction of movement of containers,

a handling zone adjoining said zone of reception of containers and having a portion of the track, and

a zone of delivery of containers adjoining said handling zone of containers and comprising:

a portion of the track permanently communicating with the atmosphere, and

an independent drive for moving the containers along said portion of the track within said zone of delivery of containers;

a first pipeline connecting the zone of delivery of one of said handling stations to the zone of reception of a second of said handling stations and serving for moving the containers in one direction;

a second pipeline connecting the zone of delivery of a second of said handling stations to the zone of reception of the first handling station and serving for moving said containers in the opposite direction;

a source of compressed air; and

air admission pipes for connecting said first and second pipelines to said source of compressed air, each of said containers having at least one sealing member closing the cross-sectional area of said first and second pipelines, said air admission pipes being spaced from the entrance to said first and second pipelines at a distance equal to or greater than the distance between the adjacent sealing members of adjacent containers when they are in the closest position relative to each other and permanently communicating with said source of compressed air, said first and second pipelines and portions of the tracks of said handling stations forming a closed loop track, a portion of the track within the zone of reception of one of the handling stations being arcuated in the horizontal plane and having side rails, a member made of friction material being secured to one rail having greater radius of curvature, and members of friction material being secured to the lateral side of each container to interact with the members of the side rails during the movement of the container along the arcuated portion of the track.

4,170,945
MOTORIZED RAILWAY VEHICLES

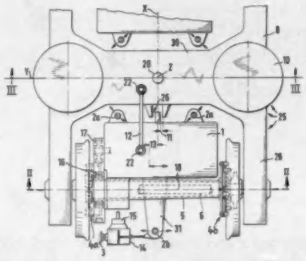
Ulrich Kayserling, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 846,815

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650035

Int. Cl.[2] B61C *3/00, 9/44, 9/48, 17/00*

U.S. Cl. 105—133 **18 Claims**



1. In combination with the body of a self-propelled high speed rail vehicle having a frame member, a bogie arrangement which includes: at least one driving bogie supporting said body including an underframe, each bogie comprising a transverse beam and two longitudinal substantially parallel beams laterally spaced from each other and forming with said transverse beam an H configuration, at least one electric motor having a housing and a rotor drivingly connected to said at least one driving bogie, each bogie having at least one motor-driven driving-wheel set drivingly connected to one said motor, each driving-wheel set including an axle and wheels supported thereby, each bogie supporting the body through a secondary suspension and having a common pivot point with said body, the rotor of the motor being connected via gearing and a cardan quill shaft drive having flexible articulated bearings to the driving wheel set, a plurality of swing links pivotally connected to said motor and pivotally supporting the respective motor for oscillation in a direction transverse to the respective bogie, and each bogie also comprising at least one link means pivotally connected to said adjacent motor for transmitting forces acting in the longitudinal direction of said bogie and absorbing said forces, said motor being held by at least three vertical swing links in the space between the wheel set axle and the transverse beam to be capable of transverse oscillation on the underframe of the body and the longitudinal forces of said motor being transmittable by at least one link of considerable longitudinal extent from the housing of said motor to the adjacent frame member of the vehicle.

4,170,946
PLASTIC SWINGBOARD BRACING PANEL

Michael R. Youness, 615 Canyon, Rochester, Mich. 48063

Filed Sep. 30, 1977, Ser. No. 838,090

Int. Cl.[2] B60P *7/06, 7/14;* **B61D** *45/00, 49/00*

U.S. Cl. 105—493 **1 Claim**

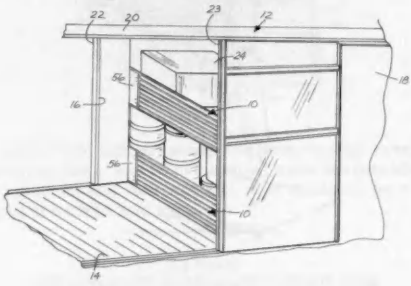
1. A swingboard comprising:

a first sheet of plastic material having a plurality of longitudinally disposed and laterally spaced ribs, each rib having a U-shaped configuration including an outwardly projecting base and upright walls, the walls of adjacent ribs being connected by an integral web;

a second sheet of plastic material having a plurality of longitudinally disposed and laterally spaced ribs, each rib of said second sheet having a U-shaped configuration and including an outwardly projecting base and upright walls, the adjacent walls of said last-mentioned adjacent ribs being connected by a second integral web, said first and

second sheets of material being joined in an abutting relationship such that the rib bases on each sheet project outwardly on opposite sides of said joined sheets and said first and second sheet webs inner opposing surfaces are in abutment and the upright walls of said ribs of one sheet are in alignment with adjacent, opposing upright walls of the other sheet;

flange members extending from the longitudinal ends of said joined sheets, each of said flange members being fused to each other and having a cut-out portion to permit access



to the interior of said fused flange members, said longitudinal ribs terminating at a location adjacent said flanges;

a structural support member located between opposed inner surfaces of said flanges;

a U-shaped metal member encompassing the outside of said flanges; and

fastening means extending through said U-shaped member, said flanges and said structural support member to secure said joined sheets to said U-shaped metal member, each of said U-shaped end members having apertures corresponding to said cut-out portion.

4,170,947

SECURITY WINDOW

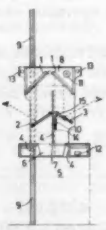
Laurence G. Morgan, The Gables, Rosemary La., Thorpe, Egham, Surrey, England

Filed Jan. 9, 1978, Ser. No. 867,667

Claims priority, application United Kingdom, Jan. 27, 1977, 3324/77

Int. Cl.[2] E05G *7/00*

U.S. Cl. 109—16 **1 Claim**



1. A security window mounted in an opening in a partition separating an area of general access from an area where money or other valuables are stored, the window comprising an upright opaque bullet-resistant screen disposed in said opening between said areas and having an exposed edge, a first mirror on the storage side of the screen and a second mirror on the other side of the screen for persons on respective sides of the screen to look into, said mirrors normally being inclined at approximately 45° to the screen, the partition being provided with a cavity facing the exposed edge of the screen, third and fourth mirrors mounted in said cavity beyond said exposed edge of the screen at right angles to each other and inclined at approximately 45° to the opaque screen so as to project images across said edge between the first and second mirrors, the first mirror being adjustable in inclination relative to said screen, an alarm, an alarm switch connected with said alarm and positioned for activation by said first mirror to operate the alarm when the first mirror is tilted away from its said normal position, the window also including a recess beneath said screen for the transmission of valuables from one side of the screen to the other side.

4,170,948

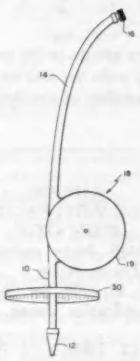
APPARATUS FOR INJECTING FLUID IN SOIL

James R. Strickland, Jr., 233 Alta Mesa Dr., South San Francisco, Calif. 94080

Filed Jul. 14, 1977, Ser. No. 815,698

Int. Cl.[2] A01C *23/02*

U.S. Cl. 111—7.1 **3 Claims**



1. A hand held soil injection device for irrigation purposes, comprising: a pipe having end insertable in soil and a second end for receiving fluid, a substantially watertight housing attached to said pipe, a rotable member positioned in said housing and having an axis of rotation substantially perpendicular to the axis of said pipe, said rotatable member having an asymmetrical weight distribution relative to said axis of rotation whereby a reciprocating motion is imparted through said housing to said pipe when said rotatable member is rotated, said pipe and housing together constituting a fluid flow path which is never totally blocked so as to provide an unobstructed fluid passageway therethrough for receiving fluid from a source of fluid and transmitting the same to said first end of the pipe, means for connecting said second end of said pipe to said fluid source and for initiating a flow of fluid through said pipe for discharge from said first end, means powered by said flow of fluid for rotating said rotatable member at a substantially uniform rate, and laterally extending means forming a shield at said first end of the pipe to prevent splashing of fluid being injected into soil.

4,170,949

NEEDLE BAR FOR A TUFTING MACHINE

Kenneth Lund, Accrington, England, assignor to Edgar Pickering (Blackburn) Limited, Blackburn, England

Filed Mar. 7, 1978, Ser. No. 884,195

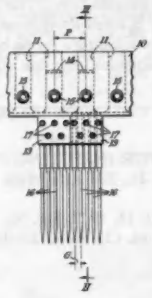
Claims priority, application United Kingdom, Mar. 16, 1977, 11174/77

Int. Cl.[2] D05C *15/00*

U.S. Cl. 112—79 R **3 Claims**

1. A needle bar for a tufting machine, comprising a main bar having a row of holes uniformly spaced at a coarse pitch, a multiplicity of contiguous segments fitted into a longitudinal location groove in one face of the main bar, each segment

having a peg accommodated in one of said holes in the main bar and retained therein by a locking screw and a row of finer holes, disposed parallel to the holes in the main bar and uniformly spaced at a finer pitch than the holes in the main bar,



and needles mounted in groups in the holes in the segments to extend away from the main bar and retained in said holes by locking screws, the number of needles in each group being equal.

4,170,950

SEWING MACHINE WITH PATTERN SELECTION INDICATOR

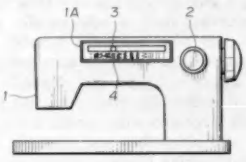
Yoshiaki Ozaki, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1978, Ser. No. 934,316

Claims priority, application Japan, Aug. 19, 1977, 52-110128[U]

Int. Cl.[2] **D05B** *3/02, 79/00*

U.S. Cl. 112—158 F **7 Claims**



1. A sewing machine, comprising a machine housing; a group of pattern cams arranged in the machine housing; cam follower means movable along the group of pattern cams; means for moving the cam follower means along the group of pattern cams for selecting a desired one of said cams; pattern indicating means on the machine housing and showing a row of pattern illustrations corresponding to the patterns which can be produced by the pattern cams; manually operated means for moving the cam follower moving means along the group of cams; electrically illuminable pattern pointer means operatively connected to the manually operated means and movable along the row of pattern illustrations, in timed relation with the movement of the cam follower means to point out a pattern illustration corresponding to a selected pattern cam; electric circuit means, including a power source and a switch, for electrically connecting the power source with the pattern pointer means to illuminate the pointer means; and switch operating means operatively connected to the manually operated means and operated in timed relation with the movement of the cam follower means to connect the pattern pointer means to the power source so that the pointer means may become illuminated and thus point out the selected pattern.

4,170,951

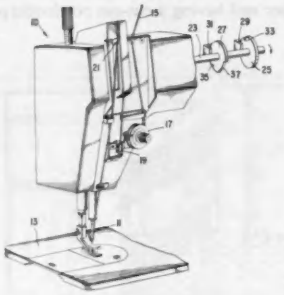
SKIPPED STITCH DETECTION SYSTEM

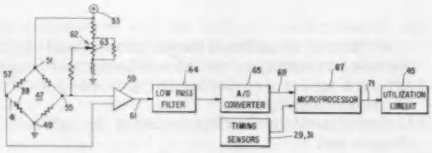
Leo Dobrjanskyj, Flushing, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,614

Int. Cl.[2] **B65H** *63/02*

U.S. Cl. 112—278 **7 Claims**





1. In a sewing machine having a support for work fabric to be stitched, cyclically operating stitch forming instrumentalities including a thread carrying needle adapted for endwise reciprocation to penetrate the fabric, a supply of thread for said needle, and a thread handling system including a tension control system for the thread disposed intermediate said supply and said needle, a skipped stitch detection system comprising:

sensing means disposed intermediate said tension control means and said needle and responsive to thread tension for supplying a tension signal, the instantaneous value of which corresponds to the thread tension at the sensing means position, the value of said tension signal having a first cyclic profile corresponding to a normal stitch and a second cyclic profile corresponding to a skipped stitch;

timing means for providing timing signals at predetermined times relative to the operating cycle of said stitch forming instrumentalities;

means responsive to said timing signals for defining examination windows for said tension signal; and

means for examining said tension signal within said examination windows and responsive to values of said tension signal corresponding to said second cyclic profile for executing a control function.

4,170,952

CRYOGENIC INSULATION SYSTEM

Thomas E. McCown, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

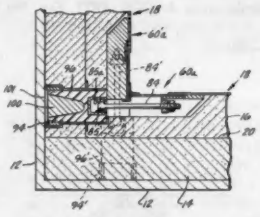
Continuation-in-part of Ser. No. 665,285, Mar. 9, 1976, Pat. No. 4,116,150. This application Jan. 17, 1977, Ser. No. 759,910

Int. Cl.[2] **B63B** *25/08;* **B65D** *25/18*

U.S. Cl. 114—74 A **21 Claims**

1. A container for cryogenic liquefied gases which comprises a container wall, at least one fiber reinforced plastic foam insulation layer disposed within said container wall and a low temperature resistant metal liner disposed adjacent the inner side of said at least one foam insulation layer, the reinforcement fibers of said fiber reinforced foam insulation layer

adjacent said liner being extended beyond the outer surface of said foam insulation layer, the exposed fiber ends of said fiber reinforced foam insulation layer extending beyond the outer surface of said foam insulation layer being stiffened, supporting



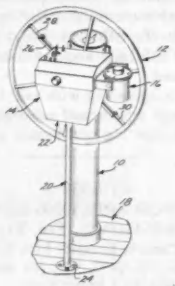
said metal liner and permitting said liner to slide over the adjacent surface of said foam insulation layer, and providing a space between said liner and said foam insulation layer for purging gases from said space.

4,170,953

DETACHABLE AUTOMATIC PILOT FOR WHEEL-STEERED BOATS

Edwin J. Pounder, Altadena, and John R. Casani, Pasadena, both of Calif., assignors to Signet Scientific Company, El Monte, Calif.

Filed Mar. 13, 1978, Ser. No. 886,150
Int. Cl.[2] B63H *25/04*
U.S. Cl. 114—144 E **13 Claims**



1. An apparatus for automatically steering a boat having a wheel-operated steering mechanism operatively connected to a rudder, said wheel having a plurality of spokes connected to a central hub, said apparatus comprising:

a housing adapted to be maintained in a fixed position relative to a deck of said boat;

an actuator assembly having a central portion fitted about said central hub of said wheel, and further having a pair of actuator arms having outer extremities adapted to be biased toward and affixed to a pair of said spokes of said wheel, said extremities being detachable from said spokes whereby said apparatus may be removed from said wheel, said actuator assembly being rotatable relative to said housing to turn said wheel;

means for sensing the difference between a desired direction and an actual direction to generate an error signal;

means for comparing a rudder position signal with said error signal to generate a difference signal, and for generating a command signal in response to said difference signal;

means for rotating said actuator assembly in response to said command signal whereby said rudder is moved in a direction to steer said boat in said desired direction; and

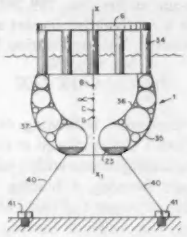
clutch means positioned between said means for rotating and said actuator assembly for selectively disengaging said means for rotating from said wheel.

4,170,954

SEMI-SUBMERSIBLE VESSEL

Victor Rinaldi, No. 9 Calle Cuello URB "La Florida", Caracas, Venezuela

Continuation-in-part of Ser. No. 699,089, Jun. 23, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,461
Claims priority, application France, Jun. 27, 1975, 75 20349
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—265 **21 Claims**



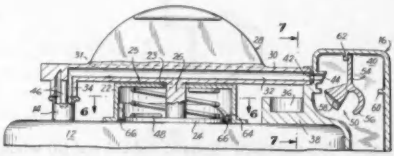
1. A semi-submersible vessel comprising a completely submerged sealed closed chamber, a deck fixed upon the chamber by means of a semi-submerged support structure, the chamber being defined by external and internal walls each forming a curved surface, said internal wall defining a concave cavity open at its two ends, the internal surface of said chamber forming an opening in the central part at the bottom of the cavity, the two surfaces forming the majority of the external surfaces of the chamber, the great majority of the lines of action of the hydrostatic forces acting on said curved surfaces traversing a compact zone which surrounds the geometric center of the chamber, the volume of said compact zone being small in comparison to the total volume of the chamber, additionally comprising a plurality of openings located in the proximity of the larger perimeter of the chamber, the total length of the openings being at least three quarters of the larger perimeter of the chamber.

4,170,955

DANGER ALARM DEVICE

Gordon K. Zern, Box 74, Hungerford Rd., Briarcliff Manor, N.Y. 10510

Filed Nov. 13, 1978, Ser. No. 959,415
Int. Cl.[2] G08B *3/06*
U.S. Cl. 116—67 R **10 Claims**



1. A danger alarm device comprising:

a container of pressurized gas having an activation nozzle on a top portion thereof;

a resonant chamber associated with said container and having a resonance cavity selectively connectable to said activation nozzle, and a sound emitting portion;

a longitudinally extending shaft having an internal channel and rotatably mounted on said top portion of said container, said internal channel having a right-angle extension on a first end, said first end of said channel communicating with said activation nozzle when said alarm is operational,

a second end of said channel communicating with said resonance cavity when said alarm is operational;

means for resiliently urging said shaft toward said top portion of said container; and

means for securely holding said shaft when said alarm is not operational.

4,170,956

THERMALLY-RESPONSIVE INDICATING DEVICE

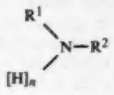
Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 799,207, May 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 722,678, Sep. 13, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 886,058

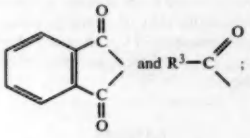
Int. Cl.[2] G01K *1/02*

U.S. Cl. 116—218 **21 Claims**

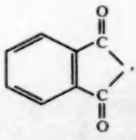
1. A thermally-responsive indicating device comprising a housing which defines a cavity closed at one end and open at the other end, an indicating means within said cavity for movement relative to said housing, a biasing means within said cavity for urging the movement of said indicating means relative to said housing, and a fusible locking means within said cavity for resisting movement of said indicating means by said biasing means, wherein said locking means is solid at about 20° C., and is adapted to fuse at a predetermined temperature and wherein said locking means has the formula



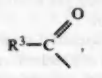
wherein R^1 is selected from



R^2 is selected from saturated aliphatic radicals, aryl radicals and aryl-substituted aliphatic radicals; R^3 is a saturated aliphatic radical containing from about 1 to 20 carbon atoms; and n is 0 or 1; provided that (i) when R^1 is



n is 0 and R^2 is a saturated aliphatic radical and (ii) when R^1 is



n is 1, R^2 is selected from saturated aliphatic radicals, aromatic radicals and aryl-substituted aliphatic radicals; and provided further that the sum of the number of carbon atoms in R^1 and R^2 is at least about 10.

4,170,957

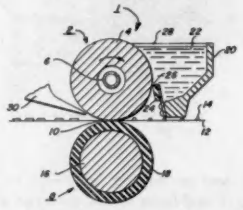
FIXING DEVICE USING POLYARYLSILOXANES AS RELEASE AGENTS

Clifford O. Eddy, and Thomas R. Hoffend, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 662,658, Mar. 1, 1976, Pat. No. 4,065,586. This application Aug. 29, 1977, Ser. No. 828,363

Int. Cl.[2] G03G *15/20*

U.S. Cl. 118—60 **7 Claims**



1. Apparatus for contact fusing toner particles to a substrate, said apparatus comprising:

a heated structure comprising a rigid metal core and a coating of a polyarylsiloxane release material being the type which is capable of interacting with the metal core surface, said coating comprising a first barrier coating portion in contact with said metal core surface, said first portion being formed during operation of the apparatus at the interface of the metal core surface and the polyarylsiloxane release material, the first portion having a greater affinity for the metal core surface than the toner particles and thereby preventing toner particles from contacting the metal core, and a second replenishing release portion continuously applied, the release portion being the polyarylsiloxane release material and having a cohesive force which is less than the adhesive forces between the toner particles and the substrate and the cohesive forces of the toner particles; and

a backup member cooperating with said heated structure to form a nip through which said substrate passes with said toner particles contacting said heated structure.

4,170,958

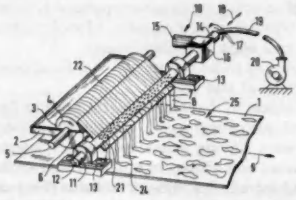
DEVICE FOR APPLYING DESIGNS

Manfred Moser, Krefeld-Fischeln, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,182

Int. Cl.[2] B05C *5/00*

U.S. Cl. 118—325 **6 Claims**



1. In a device for applying designs to advancing webs, particularly textile and similar webs in which the design liquid is present, prior to application to the web, in the form of a film extending over the web in the width direction, and having a movable air nozzle, which is directed toward the film for irregularizing the film the improvement comprising said air nozzle being in the form of a tube extending across the web close to the film, said tube supported for rotation and for movement back and forth across the web, said tube having a plurality air outlet openings distributed over its surface and directed toward said film, a compressed air feed line coupled to

said tube; and means for rotating said tube and moving said tube back and forth.

4,170,959

APPARATUS FOR BUMP-PLATING SEMICONDUCTOR WAFERS

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Apr. 4, 1978, Ser. No. 893,480
Int. Cl.[2] B05C *5/02*
U.S. Cl. 118—627 **3 Claims**

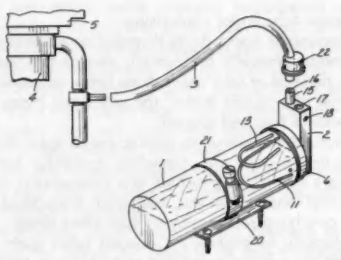
1. An apparatus for bump-plating semiconductor wafers to bump-plate one surface thereof, comprising a plurality of cup-shaped plating basins secured within a container, the respective plating basins including cathode contact tips and a mesh-shaped anode, a plurality of holders secured in a cover which is movable relative to and above said container, each of said holders being aligned and engageable with a relevant one of said plating basins, semiconductor wafers to be plated being adapted to be set horizontally between said plating basins and said holders, the respective plating basins having an axial passage in the center of the bottom thereof communicated with a common conduit disposed in said container for blowing up therethrough plating liquid against the semiconductor wafers, said apparatus being characterized in that the respective plating basins have an annular protrusion provided on the inner peripheral surface thereof to thereby bias internally a portion of plating liquid blown up along the inner peripheral surface of the plating basin so as to contact uniformly plating liquid to the underside of wafer and to average electric field density applied on the wafer surface.

4,170,960

ADDITIVE SUPPLY AND CONTROL DEVICE

Walter F. Germack, 4194 Clay St., Geneva, Ohio 44041, and William L. Smith, 584 E. Main St., Madison, Ohio 44057

Filed Jul. 3, 1978, Ser. No. 921,484
Int. Cl.[2] F02B *77/00*
U.S. Cl. 123—198 A **9 Claims**



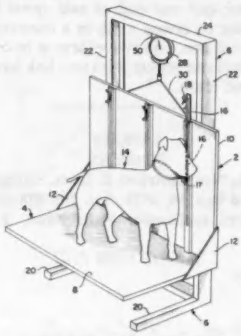
1. In combination with an engine operating on fuel/air mixture passing through a manifold in which a vacuum is developed, a device for supplying an additive from a source of supply, to the mixture in response to such vacuum comprising a container for such additive, a well body to receive additive from said container, a series of wells extending generally vertically in said body, one of said wells constituting an atmospheric well connected by an opening to receive additive at the lower portion of the container, the said well being open to the atmosphere at the upper end, a fluid lift well in the body, a passageway connecting the lower ends of the wells aforesaid, the lift well being connected by a fluid line to the said manifold, an orifice in the fluid line leading to the manifold, means to regulate the flow of additive from the lift well to the orifice, an evacuator well in the body, a passage connecting the evacuator well to the fluid lift well intermediate the regulating means and the orifice, a passageway extending from the evacuator well into the interior of the container, said passageway having an open end normally above additive in the container, said container being thereby evacuated above adequate additive therein by vacuum developed during operation of the engine, additive likewise being supplied to the manifold by such vacuum through the fluid lift well.

4,170,961

VETERINARY EXAMINATION TABLE

Alexander J. Rosenberg, and Philip M. Rosenberg, both of 1000 Edge Hill Rd., Roslyn, Pa. 19001

Filed Jul. 29, 1977, Ser. No. 820,125
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—103 **10 Claims**



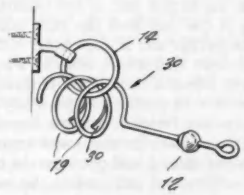
1. An examination table for animals which comprises
a frame;
a platform movably connected to said frame and adapted to be vertically movable with respect thereto between a low position and an elevated position;
an actuator means connected to said frame and to said horizontal platform for causing relative vertical movement therebetween; and
a force transducer means connected to said platform and to said frame for permitting a determination to be made of the weight of an animal placed on the platform,
the said force transducer means comprising a scale and a cable interconnected between the scale and a portion of the platform.

4,170,962

DOG OR ANIMAL RETAINER DEVICE

Donald W. Limbaugh, 640 Ottawa Ave., Defiance, Ohio 43512

Filed Sep. 28, 1977, Ser. No. 837,375
Int. Cl.[2] A01K *1/064*
U.S. Cl. 119—109 **1 Claim**



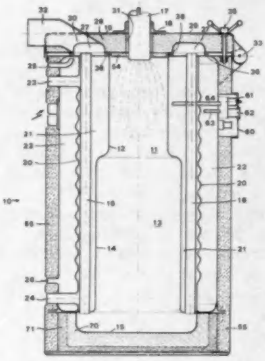
1. A dog or animal retainer device, comprising, in combination, a leash, one end of said leash being adaptable for attachment to a stationary object, while an opposite end of said leash is attachable to an animal that is intended to be tethered in order to not wander away, said leash incorporating means to prevent knotting or tangling, and each opposite end of said leash being provided with a spiral loop; said spiral loop comprising a stiff material, and including a plurality of turns that

are spaced apart from each other, one end of said spiral loop being attachable to an end of said leash by means that allow swiveling; said turns of said spiral loop being made in any shape, said spiral loops comprising any number of said turns, and said turns being any desired distances apart; said spiral loop at each end of said leash being attachable to a ring through which it may be threaded; said leash comprising a substantially rope-like member; said swiveling means comprising a swivel wherein one end thereof is freely rotatable respective to an opposite end thereof; a plurality of said swivels being located in spaced-apart relationship along a length of said leash; a pull on said device exerting a force against all of said turns of said spiral loop; said spiral loop including a spur on each turn thereof; and one end of said spiral loop having a transverse opening receiving a pin in a transverse opening at one end of a swivel arm, said swivel arm at its other end being connected by a ball and socket joint to a link having a loop for attachment to said leash.

4,170,963
BOILERS

Eugen J. Siegrist, Neufeldstrasse 5, Bern, Switzerland

Filed Feb. 16, 1978, Ser. No. 878,456
Claims priority, application Switzerland, Feb. 18, 1977, 2023/77
Int. Cl.[2] F22B *7/12*
U.S. Cl. 122—33 **8 Claims**



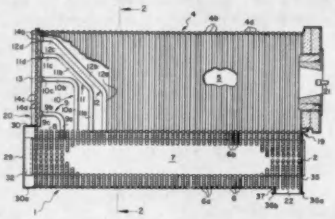
1. A boiler, comprising a firebox with a central axis, a gaseous or liquid fuel burner arranged at one axial end of the firebox on the central axis thereof, first wall means surrounding the firebox to define an annular water jacket therearound, a circular array of fire tubes surrounding the firebox and extending axially through the water jacket, means defining an annular gas collector at the burner end of the firebox, the fire tubes communicating at one end with the axial end of the firebox remote from the burner and at their other ends with the gas collector, and second wall means defining a hot water boiler, the improvement wherein the firebox is formed by first and second cylindrical wall portions respectively defining a primary and a secondary furnace having a larger diameter than the diameter of the primary furnace, and a stepped wall portion joining the first and second wall portions, the hot water boiler being annular in form and surrounding the water jacket, the first wall means separating the water jacket and hot water boiler and lying against the circular array of fire tubes.

8. A boiler operating process including the steps of operating a boiler at a furnace temperature of about 900° C., the boiler comprising a firebox with a central axis, a gaseous or liquid fuel burner arranged at one axial end of the firebox on the central axis thereof, first wall means surrounding the firebox to define an annular water jacket therearound, a circular array of fire tubes surrounding the firebox and extending axially through the water jacket, means defining an annular gas collector at the burner end of the firebox, the fire tubes communicating at one end with the axial end of the firebox remote from the burner and at their other ends with the gas collector, and second wall means defining a hot water boiler, the firebox being formed by first and second cylindrical wall portions respectively defining a primary and a secondary furnace having a larger diameter than the diameter of the primary furnace, and a stepped wall portion joining the first and second wall portions, the hot water boiler being annular in form and surrounding the water jacket, the first wall means separating the water jacket and hot water boiler and lying against the circular array of fire tubes, the operating step being carried out at a slight excess pressure of about 1 to 2 mm water column in the primary furnace, forcing gases from the secondary furnace at a temperature of 250° to 450° C. into the fire tubes, and exhausting the forced gases from the boiler at a gas temperature of 100° to 120° C.

4,170,964
WATER-TUBE BOILER

Thomas C. Jehn, Onalaska; Francis J. Roraff, La Crosse, both of Wis., and Gerald T. Bauers, Kansas City, Mo., assignors to The Trane Company, La Crosse, Wis.

Filed Jul. 10, 1978, Ser. No. 923,503
Int. Cl.[2] F22B *37/24, 21/30*
U.S. Cl. 122—235 G **21 Claims**



1. A water-tube boiler comprising:

a. an elongated water drum disposed at a lower level and extending generally horizontally along a first longitudinal axis, one end of said water drum being disposed adjacent a front end of said boiler, the other end being disposed adjacent a rear end thereof;

b. an elongated steam drum disposed at an upper level above said lower level and extending generally horizontally along a second longitudinal axis substantially parallel to said first longitudinal axis, said steam drum being in generally overlying relationship to said water drum;

c. a plurality of generally C-shaped tubes each having a lower leg portion connected to said water drum and extending generally horizontally therefrom in a direction transverse to said first longitudinal axis, a bight portion extending generally vertically to a level substantially equal to said upper level, and an upper leg portion extending generally horizontally in a direction transverse to said second longitudinal axis toward said steam drum and connected thereto; said plurality of C-shaped tubes being disposed in generally parallel, side-by-side relationship and including fin means interconnecting adjacent ones thereof so as to define an elongated, enclosed furnace chamber extending along a longitudinal axis generally parallel to said first and second longitudinal axes;

d. a plurality of convection tubes, each connected to and extending generally vertically between said steam drum and said water drum, said convection tubes being arranged in a two dimensional array extending along said first and second longitudinal axes and in a direction transverse thereto so as to define an elongated convection section adjacent said furnace chamber; the outermost, longitudinally extending row of said convection tubes

including fin means interconnecting adjacent ones thereof so as to enclose said convection section; further comprising means for separating said convection section and said furnace chamber along a portion of their lengths while defining adjacent the rear ends thereof a flow passage therebetween;

e. structure disposed adjacent the rear end of said furnace chamber comprising

i. feeder conduit means disposed adjacent the rear end of said furnace chamber at a level below the lower leg portions of said C-shaped tubes and connected to said water drum;

ii. a plurality of riser tubes connected to said feeder conduit means and extending generally vertically therefrom to a level above the upper leg portions of said C-shaped tubes, said riser tubes being disposed in generally parallel, side-by-side relationship so as to define a planar tube wall extending across the rear end of said furnace chamber and including fin means interconnecting adjacent ones thereof so as to enclose the rear end of said furnace chamber; and

iii. return conduit means disposed above the upper leg portions of said C-shaped tubes connecting said riser tubes to said steam drum;

f. means for admitting water to be vaporized to said boiler for flow from said water drum into the lower leg portions of said C-shaped tubes, the lower ends of a first portion of said convection tubes and into said feeder conduit means and riser tubes, whereby at least a portion of said water is vaporized while passing through said tubes and exits therefrom into said vaporized water from said steam drum; a second portion of said convection tubes serving as downcomers to return unvaporized water from said steam drum to said water drum;

g. front and rear wall means for enclosing the respective front and rear ends of said furnace chamber and convection section;

h. means for effecting combustion within said furnace chamber whereby heat is transferred to said C-shaped tubes, to those convection tubes disposed immediately adjacent said furnace chamber and to said riser tubes, the resulting products of combustion passing via said flow passage and through said convection section wherein heat is transferred to said convection tubes; further comprising combustion products outlet means for discharging products of combustion from said convection section;

wherein the improvement comprises

i. said rear wall means including structure for sealing said planar tube wall with respect to the rear end of said furnace chamber comprising

i. first serrated plate sealing means disposed at a level above the upper leg portions of said C-shaped tubes including a first edge portion having a plurality of serrations, each of said riser tubes being in sealing engagement with one of said serrations; and a second edge portion;

ii. second serrated plate sealing means disposed at a level below the lower leg portions of said C-shaped tubes including a first edge portion having a plurality of serrations, each of said riser tubes being in sealing engagement with one of said serrations, and a second edge portion;

iii. first and second plate sealing means in sealing engagement with the second edge portions of said first and second serrated plate sealing means, respectively, and extending therefrom to a position in sealing engagement with respective upper and lower walls of said furnace chamber, as defined by the upper and lower leg portions of said C-shaped tubes, whereby the upper and lower ends of said planar tube wall are sealed with respect to the upper and lower walls of the rear end of said furnace chamber.

4,170,965

COMPENSATION FOR INHERENT FLUCTUATION IN OUTPUT LEVEL OF EXHAUST SENSOR IN AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

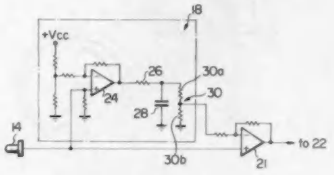
Shigeo Aono, Seki, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Oct. 5, 1976, Ser. No. 729,826

Claims priority, application Japan, Oct. 27, 1975, 50-145316[U]

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EE **3 Claims**



2. In a feedback control system for maintaining the air-fuel ratio of a combustible mixture fed to an internal combustion engine at a predetermined ratio, the system including an exhaust sensor which is installed in the exhaust line of the engine and produces an output voltage representing the concentration of a definite component of the exhaust gas, the concentration being in dependence on the air-fuel ratio of the combustible mixture consumed in the engine, a comparison circuit to detect the magnitude of a deviation of the output voltage of the exhaust sensor from a reference voltage and a control circuit to control the function of an air-fuel proportioning device based on the detected magnitude of the deviation,

wherein the improvement comprises:

said comparison circuit comprising a comparator which receives directly and continually the output voltage of said exhaust sensor and a reference voltage producing circuit having a capacitor, a voltage divider connected in parallel with said capacitor, and an operational amplifier with a positive input terminal thereof connected to said exhaust sensor, a negative input terminal thereof connected to a source of constant voltage and an output terminal thereof connected to said capacitor through a first resistor and also to said negative input terminal through a second resistor such that said operational amplifier provides a high input impedance to said reference voltage producing circuit and that said capacitor receives continually the output voltage of said exhaust sensor through said operational amplifier and said first resistor and is discharged not only through said voltage divider but also through said first resistor upon a lowering of the output voltage of said exhaust sensor, so that said voltage divider is impressed continually with the terminal voltage of said capacitor and provides an output voltage which is in a predetermined proportion to the terminal voltage of said capacitor and corresponds to a mean value of the output voltage of said exhaust sensor, said output voltage provided by said voltage divider being applied continually to said comparator as said reference voltage, said comparator being a differential amplifier with a positive input terminal thereof connected directly to said exhaust sensor and a negative input terminal thereof connected to the output terminal of said voltage divider.

4,170,966

MIXTURE-COMPRESSING INTERNAL COMBUSTION ENGINE, ESPECIALLY FOUR-CYCLE ENGINE

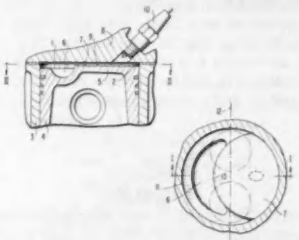
Karl-Walter Schmidt, Weinstadt, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Feb. 22, 1977, Ser. No. 770,564

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607561

Int. Cl.[2] F02B *3/02, 3/00, 75/04, 41/00*

U.S. Cl. 123—32 SA 21 Claims



1. A mixture-compressing internal combustion engine including cylinder means, piston means reciprocable in the cylinder means, cylinder head means, a combustion chamber formed in one of two parts consisting of the piston means and the cylinder head means, and an ignition source located in the cylinder head means, characterized in that said combustion chamber includes a main combustion space volume for accommodating a main portion of a fuel charge, the main combustion space volume is delimited by inner and outer boundaries extending along at least approximately circular arcs, as viewed in a plan view, the inner boundary is formed as a boundary wall and is disposed the nearest to the ignition source and is at least approximately concentric to the ignition source, a part of said piston means at least within an area of the ignition source has a matching configuration to the cylinder head means so as to form a small gap for accommodating a small portion of a fuel charge between the cylinder head means and said part of the piston means shortly prior to an end of the compression stroke whereby, with an igniting by the ignition source, the smaller portion of the fuel charge is initially ignited in the small gap with the main portion of the fuel charge being combusted, at the earliest, beginning with an upper deadcenter position of the piston means.

4,170,967

APPARATUS FOR CONTROLLING THE MIXTURE OF AN INTERNAL COMBUSTION ENGINE

Wolf Wessel, Oberriexingen, and Gerhard Stumpp, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 764,323, Jan. 31, 1977, abandoned. This application Oct. 19, 1978, Ser. No. 952,905

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1976, 2604160

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EE 3 Claims

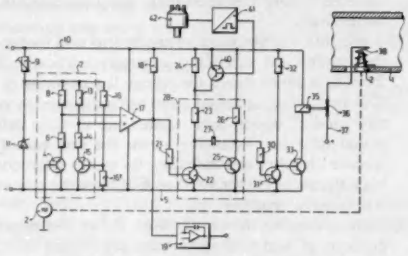
1. An apparatus for controlling the fuel-air mixture of an internal combustion engine, comprising:

an oxygen sensor, located in the exhaust system of the engine;

a comparator circuit, connected to said oxygen sensor and connectable to a fuel-air mixture control means of the engine, said comparator circuit receiving from said oxygen sensor an actual value output signal which is compared to a set point value, for generating an output signal which alternates between two discrete states depending on the actual value output signal from said oxygen sensor, said output signal being applied to the fuel-air mixture control means;

an integrating timing circuit, connected to the output of said comparator circuit, said integrating timing circuit being triggered by the output signals from said comparator circuit;

a switching circuit, connected to said integrating timing circuit, said switching circuit being actuated by said integrating timing circuit into a first switching state when said



output signal from said comparator alternates in a predetermined manner and actuated into a second switching state when said output signal from said comparator does not alternate in a predetermined manner; and

a heater circuit, connected to said switching circuit and a power source for heating said oxygen sensor; whereby said heater circuit is energized when said switching circuit is in its second switching state for a period in excess of that period determined by the time constant of said integrating timing circuit.

4,170,968

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

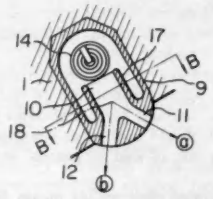
Masaaki Noguchi, Nagoya; Setsuro Sekiya, and Kashuhiko Motosugi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 13, 1977, Ser. No. 815,243

Claims priority, application Japan, Jul. 19, 1976, 51-85869

Int. Cl.[2] F02B *19/10, 19/16*

U.S. Cl. 123—32 SP 8 Claims



1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head mounted on said cylinder block and having therein a cavity defining an auxiliary chamber;

a piston reciprocally movable in said cylinder bore, said piston and said cylinder head defining a main chamber therebetween;

an intake valve movably mounted on said head for leading a combustible mixture into said main chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a spark plug having a spark gap located in said auxiliary chamber; and

passage means communicating said main chamber with said

auxiliary chamber and comprising a first passage having a first open end opening into the interior of said auxiliary chamber at a position near the spark gap of said spark plug, and second passages joined with said first passage and having second open ends opening into said main chamber defining therein two spaces which have approximately equal volumes and include the corresponding second open ends when said piston reaches the top dead center position, said second open ends being directed to centers of the corresponding spaces.

4,170,969

AIR FUEL MIXTURE CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

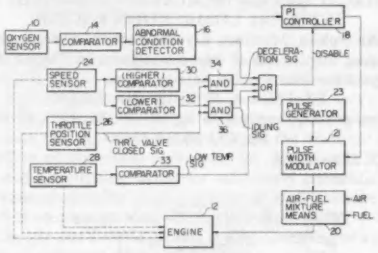
Masaharu Asano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 628,903, Nov. 5, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,955

Claims priority, application Japan, Jun. 11, 1974, 49-127655; Jun. 18, 1975, 50-73054

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EE **12 Claims**



1. Air fuel mixture apparatus for an internal combustion engine of an automotive vehicle, comprising:

means for detecting a composition of exhaust gases from said engine and providing a composition representative signal;

a control amplifier coupled to the exhaust composition detecting means to provide an error correction signal;

means for detecting when the amplitude of the exhaust composition detecting means is at a high level and when said amplitude is at a lower level;

means connected to said amplitude detecting means for measuring (1) a first period of time elapsed between transitions from the high level to the lower level and from the lower level to the high level and (2) a second period of time elapsed between transitions from the lower level to the high level and from the high level to the lower level;

means for comparing said first and second measured elapsed time periods with a predetermined time duration;

means responsive to said comparing means for disabling the control amplifier when either of said measured elapsed time periods is greater than said predetermined duration; and

means responsive to the error correction signal for adjusting the mixture ratio of air to fuel to be supplied to said engine.

4,170,970

INTERNAL COMBUSTION ENGINES

John H. McCandless, 2724 San Rae Dr., Kettering, Ohio 45419

Filed Nov. 10, 1976, Ser. No. 740,537

Int. Cl.[2] F02B *33/22, 25/12*

U.S. Cl. 123—53 BA **2 Claims**

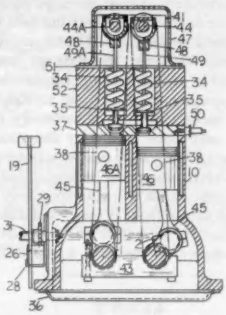
1. A split four cycle variable compression combustion engine comprising:

cylinders which are arranged in pairs so that intake and compression strokes take place in one cylinder and power and exhaust strokes take place in a second cylinder with the pistons of the two cylinders connected to separate cranks;

a system of differential gears which are controlled by an accelerator pedal and which connect the two cranks in a manner which will cause any motion of the accelerator pedal to change the phase relation between the cranks;

a means of causing changes in the phase relation between the cranks to produce changes in the compression ratio of the engine;

a passageway which connects the tops of the two cylinders and which is controlled by two valves which will permit



gases to flow between the cylinders from the time when one piston nears the top of its stroke until the other piston nears the top of its stroke but which will prevent gases from flowing between the cylinders at all other times;

linkages which include a cam and which connect to a rotor coming from the differential gears to the throttle valve of a carburetor in a manner which will cause any change in the pressure of the gases in an intake manifold to be compensated for by changes in the compression ratio of the engine thus keeping the pressures at the time of ignition constant at all loads.

4,170,971

PNEUMATIC PRESSURE CONTROL VALVE ASSEMBLY

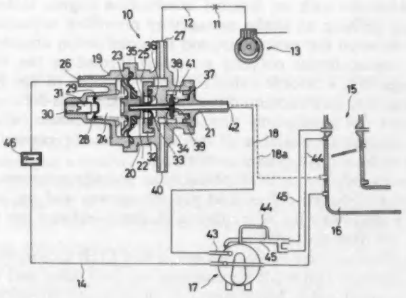
Minoru Yamanaka, and Yasuhiro Kawabata, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 20, 1977, Ser. No. 799,035

Claims priority, application Japan, May 21, 1976, 51-59347

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **4 Claims**



1. In a pneumatic pressure control system in combination with an internal combustion engine including an intake manifold which provides a source of negative pneumatic pressure, an air pump driven by said engine which provides a source of

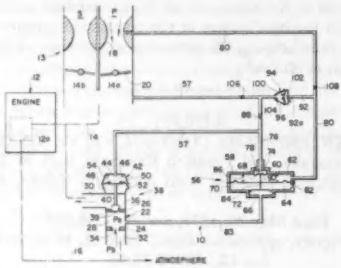
positive pneumatic pressure, passage means for introducing atmospheric pressure into said system and a pneumatic pressure control valve assembly, said control valve assembly comprising a body, slidable actuator means slidably disposed within said body including means defining first and second pressure chambers within said body, said first chamber being connected to said source of negative pneumatic pressure and said second chamber being connected to said source of positive pneumatic pressure, a spring arranged within said first chamber and urging said slidable means against the positive pneumatic pressures within said second chambers, means for defining a third chamber within said body said second chamber being disposed between said first and third chambers, said third chamber being connected to said passage means and to an outlet port and valve means located within said third chamber operatively connected to said slidable means for controlling fluid communication between the passage means and said outlet port, said valve means having substantially the entire effective surface thereof exposed to said atmospheric pressure from said passage means so that substantially equal pressure will be exerted on said valve means by the atmospheric pressure in all positions of the valve means whereby the opening and closing of the valve means will be controlled by movement of said slidable means which is responsive only to changes in said negative and positive fluid pressures within the first and second chambers biasing the valve means in one direction and the spring biasing the valve means in an opposite direction.

4,170,972

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jul. 21, 1977, Ser. No. 817,994
Claims priority, application Japan, Jul. 23, 1976, 51/87845
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **12 Claims**



1. An exhaust gas recirculation (EGR) control system in combination with an internal combustion engine including means defining an intake passageway providing communication between the atmosphere and the combustion chamber of the engine, means defining a venturi formed in the intake passageway, a throttle valve rotatably disposed in the intake passageway downstream of the venturi, and means defining an exhaust gas passageway providing communication between the combustion chamber of the engine and the atmosphere, said EGR control system comprising:

means defining an EGR passageway providing communication between the exhaust gas passageway and the intake passageway for recirculating thereinto exhaust gas emitted from the engine;

an EGR control valve disposed in said EGR passageway to separate said EGR passageway into two parts, said EGR control valve being operable in opposite directions to increase and reduce the pressure of engine exhaust gas in the part of said EGR passageway upstream of said EGR control valve for controlling the flow of recirculated engine exhaust gas;

means for operating said EGR control valve in opposite directions to increase and reduce the exhaust gas pressure in the part of said EGR passageway upstream of said EGR control valve in accordance with a decrease and an increase in said exhaust gas pressure and in accordance with a decrease and an increase in a venturi vacuum in said venturi, respectively; and

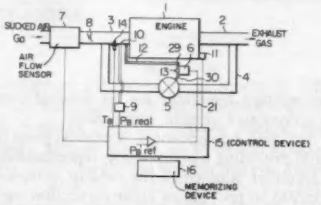
means for decreasing the degree of said venturi vacuum applied to said operating means during high speed and low load engine operation.

4,170,973

EXHAUST GAS RECIRCULATION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, Mishima; Kiyoshi Kobashi, Susono, and Jiro Nakano, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 8, 1977, Ser. No. 849,556
Claims priority, application Japan, Jul. 11, 1977, 52-82043
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **3 Claims**



1. An exhaust gas recirulation system of an internal combustion engine, in which a part of the exhaust gas of the internal combustion engine is drawn out from an exhaust pipe and returned to an intake pipe through a control valve; said system comprising:

a memorizing device which memorizes the reference pressure (Pb ref.) in the intake pipe corresponding to the optimum amount of recirculation exhaust gas experimentally determined for different combinations of the amount of sucked air (Ga) being introduced into the internal combustion engine and the engine rotating speed (N);

means for detecting the amount of sucked air (Ga) being introduced into the internal combustion engine, the engine rotating speed (N) and the pressure (Pb real) in the intake pipe, during actual operation of the engine;

means for reading out the reference pressure (Pb ref.) in the intake pipe from said memorizing device in accordance with the actually detected amount of sucked air (Ga) and engine rotating speed (N);

means for comparing the actually detected pressure (Pb real) in the intake pipe with the read out reference pressure (Pb ref.) in the intake pipe, and for generating an electrical signal in accordance with the difference therebetween; and

means for actuating said control valve so as to make the actually detected pressure (Pb real) coincide with the read out reference pressure (Pb ref.) in accordance with said electrical signal.

4,170,974
HIGH PRESSURE FUEL INJECTION SYSTEM

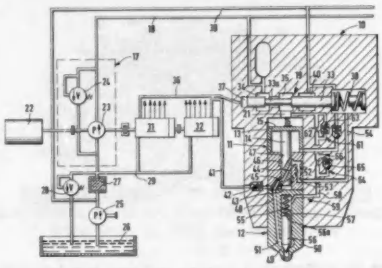
Odon Kopše, Stuttgart, and Heinz Kuschmierz, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,248

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558789

Int. Cl.[2] **F02M** *39/02;* **F02B** *15/00*

U.S. Cl. 123—139 AT **14 Claims**



1. In a high pressure fuel injection system which includes a hydraulically driven piston-type pump and nozzle assembly for each cylinder, each assembly further including a servo pressure chamber, a servo piston in said pressure chamber, said servo piston having a diameter larger than the diameter of the pump piston of said piston-type pump for actuating said pump piston, and a switching valve for selectively connecting the servo pressure chamber with a source of high pressure fluid and with a return line, said nozzle further including a valve-closing needle and a valve-closing spring contained in a spring chamber, the improvement comprising:

a pressure chamber situated near the end of said valve needle remote from its seat, a control chamber in which the pressure condition varies in accordance with the connections selectively made by the switching valve, and a bypass channel connected to the pressure chamber and the control chamber, the flow through which is controlled by the pressure in the control chamber and thereby by said switching valve, for selective admission of high pressure fluid to the pressure chamber, whereby a hydraulic closing force can be selectively exerted upon said valve needle in addition to the force exerted by the closing spring.

4,170,975
FUEL METERING VALVE ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

Wolf Wessel, Oberriexingen; Hermann Grieshaber, and Siegfried Holzbaur, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,675

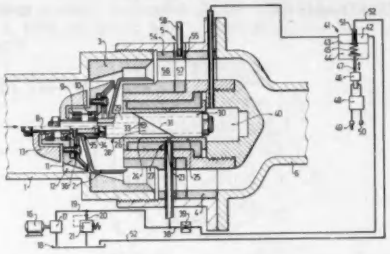
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645214

Int. Cl.[2] **F02M** *39/00*

U.S. Cl. 123—139 AW **16 Claims**

1. A fuel metering valve assembly for an internal combustion engine, said engine including an air induction tube within which are disposed, seriatim, an air flow rate member and a throttle member, and including means for applying a return force to said air flow rate member to act in opposition to the force of the air flowing through said induction tube, and wherein said air flow rate member actuates said fuel metering valve assembly to control the amount of fuel metered out by said fuel metering valve assembly, and wherein the improvement comprises:

said fuel metering valve assembly includes a first part which is disposed in said induction tube and is movable therein and defines a first opening and includes a second part which is disposed in said induction tube and is stationary with respect thereto and defines a second opening, said first and second openings cooperating by mutual overlap to define an effective cross section for fuel flow, said first



part being an axially slidable shaft and said second part being a bushing surrounding said shaft, said bushing being formed by at least two coaxial bushing elements which are separated in the axial extent by a gap which defines said second opening.

4,170,976
CONTROL DEVICE FOR DIESEL-INJECTION INTERNAL COMBUSTION ENGINES

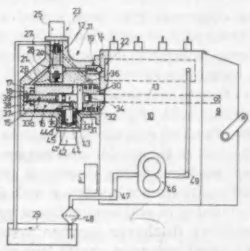
Konrad Eckert, Stuttgart; Sieghart Maier, Gerlingen, and Ernst Ritter, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,161

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713805

Int. Cl.[2] **F02D** *1/04;* **F02M** *7/12*

U.S. Cl. 123—140 FG **15 Claims**

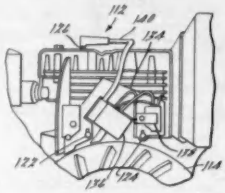


1. A control device for a diesel-injection internal combustion engine, provided with a magnetic valve adapted to determine the zero position of the delivery rate adjusting member of an injection pump, as well as to block the discharge of a hydraulic medium from a loading chamber of an adjusting member to an unpressurized chamber by means of a valve member that can be activated by a first electromagnet, said hydraulic medium being subject to the delivery pump pressure and capable of moving said adjusting member, further characterized wherein a second electromagnet includes a control member adapted to limit movement of the adjusting member, said adjusting member also being under the control of said valve member and capable of limiting movement of said adjusting member to a position which controls the delivery rate of said adjusting member of said injection pump and functions as a delivery rate stop therefor.

4,170,977
IGNITION SYSTEM

Thomas F. Carmichael, Ortonville, and Albert J. Dolecek, Lake Orion, both of Mich., assignors to Syncro Corporation, Arab, Ala.

Filed Dec. 20, 1976, Ser. No. 752,301
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 CC **12 Claims**



1. For an internal combustion engine having a magnetic field which rotates in a circular path about a predetermined axis and which has been adapted to operate with a conventional ignition system with first and second stator legs cooperative with said rotating magnetic field at first predetermined positions on said circular path for providing high voltage ignition pulses for said engine, said engine further having mounting means thereon for securing said conventional ignition system to said engine with said stator legs in said first predetermined positions relative to said rotating magnetic field to provide ignition timing for said engine, a substitute capacitive discharge ignition system comprising:

an ignition coil adapted to provide high voltage ignition pulses for said engine;

capacitive discharge circuit means including a capacitor adapted to be discharged into said ignition coil for providing high energy ignition pulses; and

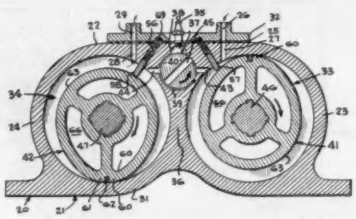
a stator structure carrying said ignition coil having a main body portion, at least one mounting leg extending outward from said main body portion, a first magnetic circuit leg having an end surface in close proximity with said circular path, and a second magnetic circuit leg having an end surface in close proximity with said circular path, said mounting leg cooperating to secure said stator to said mounting means, each of said first and second magnetic circuit legs being obliquely disposed in the same direction relative to a radial line of said circular path which intersects its respective end surface so that said respective end surfaces cooperate with said circular path at second predetermined positions on said circular path to substantially maintain said ignition timing for said engine, said second predetermined positions being displaced from said first predetermined positions in accordance with the difference of said ignition timing of said conventional ignition system and said capacitive discharge ignition system, whereby said first and second magnetic circuit legs cooperate with said rotating magnetic field and said capacitive discharge circuit means to produce said high energy ignition pulses at appropriate times for operation of said engine.

4,170,978
ROTARY ENGINE

Ali Eslami, Malek Abad Arsham 2, Mashad, Iran

Filed Apr. 4, 1978, Ser. No. 893,440
Int. Cl.[2] F02B *53/00*
U.S. Cl. 123—239 **1 Claim**

1. An air cooled rotary engine comprising a housing having a pair of hollow chambers therein, a plate affixed to said housing, air fuel inlet means communicating with one of said chambers, exhaust means communicating with the other chamber, spark plug means mounted in said plate, said housing embodying a wall portion separating said pair of chambers, said housing being provided with a bore therein, there being channels in said wall portion selectively establishing communication between said chambers and said bore, a pair of hollow rotors rotatably mounted in said chambers, a shaft member rotatably mounted in said bore, said bore embodying an enlarged portion which is greater in diameter than the diameter of the shaft member extending therethrough, said shaft member having a passageway therein, the passageway in said shaft member being mounted for movement into and out of registry with said channels, shafts extending through said rotors and operatively connected thereto, gear members on said shafts, and shaft

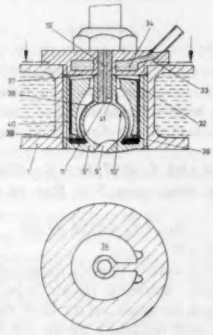


member, an endless chain having said gear members arranged in meshing engagement therewith, there being inclined openings in said housing, gate members slidably mounted in said openings, spring members for biasing said gate members into engagement with the outer surfaces of the rotors, said pair of rotors rotating at the same speed and in the same direction relative to each other, said shaft member rotating at one half the speed of the rotors, said shaft member rotating in the opposite direction from the rotors, said rotors being partially elliptical and partially circular in cross section, said shafts being of one piece construction.

4,170,979
IGNITION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE

Reinhard Latsch, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,486
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621554
Int. Cl.[2] F02B *19/10, 19/16*
U.S. Cl. 123—32 SP **19 Claims**



1. An internal combustion engine including an engine block and a cylinder head together defining at least one cylinder wherein

a piston moves to define a main combustion chamber, said cylinder head including a separate ignition chamber communicating with said main combustion chamber through a channel, and said ignition chamber provided for the pur-

pose of igniting a combustible charge, the improvement in said engine comprising means for controlling the temperature of the walls of said ignition chamber; and wherein said means for controlling the temperature of the walls of said ignition chamber is a heat pipe containing a thermal medium which flows between an evaporation region and a condensation region, said heat pipe serving for the transfer of heat of the walls of said ignition chamber to cool regions in said cylinder head.

4,170,980

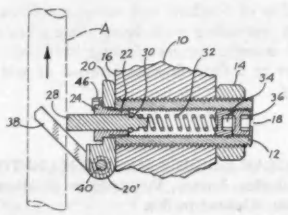
ARCHERY BOW ARROW REST

Gerald I. Killian, 16016 SE. 82nd Dr., Clackamas, Oreg. 97015

Filed Mar. 24, 1978, Ser. No. 889,979

Int. Cl.[2] F41B 5/00

U.S. Cl. 124—41 A **5 Claims**



1. An arrow rest for an archery bow having a handle and an arrow-projecting bow string, comprising

(a) a hollow base member arranged to extend through a lateral opening through an archery bow handle and having an inner end extending from and located adjacent one side of said handle,

(b) an arrow rest arm support member secured to the inner end of the base member,

(c) an arrow rest arm having an upper arrow supporting surface,

(d) pivot means interconnecting the arrow rest arm and support member for arcuate movement of the arm in a plane laterally outward from the base member and support member,

(e) resilient means interengaging the support member and arm for urging the arm resiliently to a laterally extending, arrow supporting position away from said side of said handle and intermediate the limits of pivotal movement of the arm,

(f) an arrow side support plunger member resiliently mounted in the hollow base member and extending resiliently outward through an opening in the support member above the arrow rest arm for reciprocative movement on a line disposed parallel to said plane of arcuate movement of the arm, said pivot means remaining stationary with respect to the base member regardless of the position of said arrow side support plunger member, and

(g) attaching means for securing the base member to an archery bow handle with said plane of arcuate movement of the arrow rest arm disposed perpendicular to the longitudinal dimension of the bow string, and said plane extending substantially parallel to said arrow support upper surface of said arrow rest arm.

4,170,981

BURNER OF AIR ADJUSTMENT TYPE PROVIDED WITH ANNULAR AIR PASSAGE

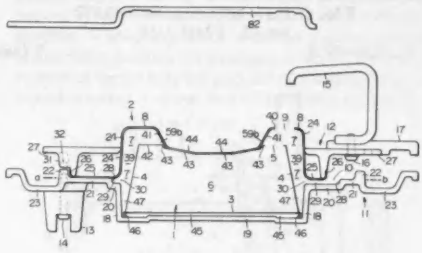
Yoshihisa Hakata, and Masahiro Nakazawa, both of Matsudo, Japan, assignors to Sky Bussan Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 14, 1977, Ser. No. 777,215

Claims priority, application Japan, Apr. 2, 1976, 51-36111; Apr. 2, 1976, 51-36112; Apr. 2, 1976, 51-36113; Jul. 29, 1976, 51-90717

Int. Cl.[2] F24C 5/02

U.S. Cl. 126—43 **25 Claims**



1. A burner of the air adjustment type using a liquid fuel, said burner comprising:

a fuel chamber including a ceiling wall, a bottom wall, a peripheral side wall, and a plurality of fuel gas openings distributed and arranged annularly on an outer edge portion of said ceiling wall;

a burner proper including a fuel chamber attachment, an inner gas chamber including a peripheral side wall and a ceiling wall, a plurality of final gas openings arranged and annularly distributed in said ceiling wall of said gas chamber, and variable air openings connected to said gas chamber;

an annular variable air passage surrounding said fuel chamber and being connected to said variable air openings at a position lower than the position of said fuel gas openings, said annular variable air passage being formed between an inner face of said peripheral side wall of said gas chamber of said burner proper and an outer face of said peripheral side wall of said fuel chamber;

said fuel gas openings, said final gas openings and said annular variable air passage being arranged in such a positional relationship that when said variable air openings are opened, a variable combustion layer is formed in said gas chamber between a fuel gas stream extended from said fuel gas openings to said final gas openings and a variable air stream on the periphery of said fuel gas stream and connected to said variable air openings;

a cylindrical or tapered central inner wall extending between the vicinity of inner end edges of said final gas openings on said ceiling wall of said gas chamber and the vicinity of said fuel gas openings, the innermost face of said gas chamber being defined by said cylindrical or tapered central inner wall, said cylindrical or tapered central inner wall and said ceiling wall of said fuel chamber being disposed so that heat can be transferred between said cylindrical or tapered central inner wall and said ceiling wall of said fuel chamber through the central portion of said ceiling wall of said fuel chamber, said central portion being surrounded by said annularly arranged and distributed fuel gas openings;

a central bottom wall projecting downwardly through said cylindrical or tapered central inner wall, said central bottom wall and said cylindrical or tapered central inner wall being integrally mounted with said ceiling wall of said gas chamber; and

said central bottom wall being thermo-conductively con-

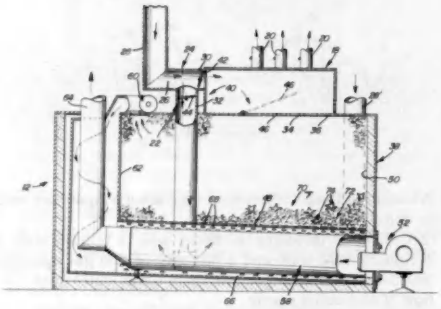
nected to said central portion of said ceiling wall of said fuel chamber.

4,170,982

SOLAR ENERGY STORAGE AND DISTRIBUTING DEVICE

Paul Gottier, Rutland, Vt., assignor to Joseph C. Soncarato, Shelton, Conn., a part interest

Filed Oct. 17, 1977, Ser. No. 843,073
Int. Cl.[2] F24H *3/14*
U.S. Cl. 126—99 A **5 Claims**



1. An energy storage and distributing device, comprising, in combination:

heat storage chamber means for retaining heat;

furnace means disposed within the chamber means;

plenum means mounted on the chamber means for directing a warm fluid to a space to be heated;

fluid distribution means associated with the plenum means and chamber means for alternately directing a fluid current directly into the plenum means and directly into the chamber means, and supplying the plenum means selectively with warm fluid from one of the chamber means and from a source disposed outside the chamber means, including, in combination: a duct having a single inlet and a pair of outlets, the inlet being connected to a source of fluid current, with one of the outlets being in communication with the plenum means and the other of the outlets in communication with the chamber means; an opening provided between the chamber means and plenum means for placing the chamber means and plenum means in communication with one another for transfer of heat from the chamber means to the plenum means; and damper means mounted in the outlets of the duct and in the opening provided between the chamber means and plenum means for selectively directing the fluid current between the chamber means and plenum means; heat exchange means disposed within the chamber means comprising; a shell extending through the chamber means and partially forming a flow path for a fluid to be heated; a tube disposed within and extending through the shell and forming the flow path in cooperation with the shell, the tube being arranged forming a passageway through the chamber means for combustion gases from the burner; a blower mounted on the chamber means and arranged in communication with the shell for forcing a fluid into the shell and over the tube along the fluid flow path; and

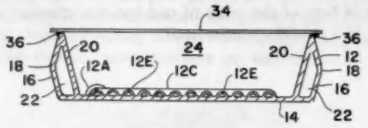
a burner arranged adjacent the heat exchanger means for applying heat to the exchanger means.

4,170,983

SOLAR HEATER

Charlton Sadler, P.O. Box 446, Brookville, Fla. 33512

Filed Jun. 30, 1978, Ser. No. 921,053
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—450 **8 Claims**



1. A solar collector comprising in combination:

a collector member having a base and a plurality of upstanding walls extending about the perimeter of said base;

a fluid input and a fluid output;

a fluid input manifold and a fluid output manifold respectively connected to said fluid input and said fluid output;

a plurality of fluid conduits interconnecting said input and said output manifolds forming a plurality of fluid tight paths between said fluid input and said fluid output;

a transparent cover member secured to said upstanding walls forming an internal area for enclosing said manifolds and said plurality of conduits; and

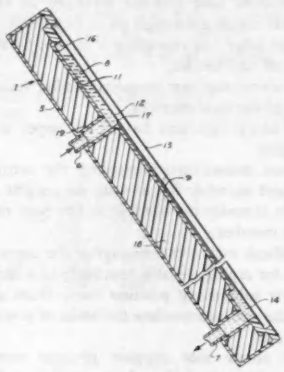
said plurality of conduits and said manifolds and said base and said upstanding walls being a one-piece molding of a curable material for transferring heat collected by said collector to a fluid flowing internal of said plurality of conduits.

4,170,984

SOLAR ENERGY HEAT COLLECTOR

Robert S. Scheffee, Lorton, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Feb. 17, 1977, Ser. No. 769,613
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—432 **72 Claims**



1. In a gravity-flow, sheet-flow, solar-energy collector including a bottom fluid-flow surface lateral and end walls, a fluid inflow header, a fluid outflow chamber and a first solid, substantially rigid transparent sheet or window which extends across the entire fluid flow area of the collector at a spaced distance from the bottom fluid-flow surface and is peripherally, sealingly attached to the lateral and end walls of the collector, the improvement wherein the fluid flowing in the collector is a dark liquid having a predetermined viscosity which is at least about 10 Cp at 120° F.; said first transparent solid sheet is at a predetermined distance from the bottom fluid-flow surface; the space between said bottom surface and said transparent first

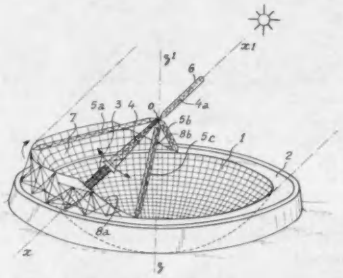
sheet is flooded with said fluid; and said fluid inflow header is provided with overflow means to produce a desired head and to equalize pressure in said header and outflow chamber; said predetermined viscosity being sufficiently high, given other variable operating conditions of said collector, to provide a desired temperature differential per unit length of said collector over a tilt angle range up to about 90°.

4,170,985

SOLAR ENERGY COLLECTOR

Bernard F. Authier, Marseilles, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 26, 1977, Ser. No. 828,171
Claims priority, application France, Sep. 20, 1976, 76 28550
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—424 **13 Claims**



1. A solar energy collector comprising a fixed spherical mirror having a reflective surface, a center located above the mirror, a radius of curvature R and a paraxial focus located on the movable axis which passes through said center of the mirror and through the center of the sun; a pair of movable boilers having a common axis passing through said mirror center and being spaced from one another along said common axis a predetermined distance, a heat-transfer fluid conduit means for defining a flow path in which said heat-transfer fluid may circulate through each boiler, and means for pivoting said common axis about said mirror center to maintain said common axis directed towards the sun; said boilers respectively comprising a low concentration boiler, elongated along said common axis, and having two axially opposite ends including a lower end, located in the vicinity of said reflective surface, and an upper end; and a high concentration boiler located in the vicinity of said paraxial focus and spaced from the upper end of the said low concentration boiler by said predetermined distance.

4,170,986

POSTURAL DRAINAGE DEVICE

Cecil E. Hinshaw, Boulder, Colo., and Pauline S. Hinshaw, 35 S. 35th St., Boulder, Colo. 80303, assignors to Pauline S. Hinshaw, Boulder, Colo.

Filed Sep. 5, 1978, Ser. No. 939,440
Int. Cl.[2] A61B *19/00*
U.S. Cl. 128—1 R **12 Claims**

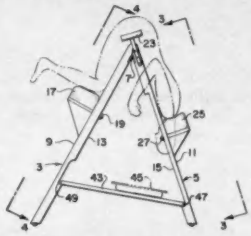
1. A postural drainage device for supporting a patient comfortably in a position in which mucus and other matter can drain by gravity from his respiratory system, said device comprising:

a main body, first and second members, and means for pivotally mounting each of said first and second members to said body for movement about a substantially horizontal axis, each of said first and second members having a substantially planar surface and being mounted to said main body with the respective surfaces facing upwardly,

means for selectively moving each of said first and second members about the respective pivotal axis at least between a first position in which said surfaces are substantially co-planar and a second position in which said surfaces form a substantially inverted V-shape,

a pair of shoulder supports and means for mounting said pair of shoulder supports to said first member adjacent said surface thereof in a spaced-apart relationship,

at least one knee support and means for mounting said knee support to said second member adjacent the surface thereof whereby in one mode of operation, said substantially planar surfaces can be moved by said moving means to said first, substantially co-planar position, the patient placed thereon facing downwardly, and said surfaces moved by said moving means to said second, substantially inverted V-shaped position with the patient assuming a comfortable position for drainage in which his knees are supported on the knee support, his mid-section on the apex of said inverted V-shape, and his shoulders on said spaced-



apart shoulder supports with his head extending downwardly therebetween and whereby in a second mode of operation, the surfaces can be moved by said moving means to said second, substantially inverted V-shaped position and the patient can assume said comfortable position for drainage by kneeling on said knee support and leaning over said surfaces with his mid-section supported on the apex of said inverted V-shape and his shoulders supported on said spaced-apart shoulder supports with his head extending downwardly therebetween, and

a pair of hand grips and means for mounting said hand grips adjacent the apex of the inverted V-shape in a spaced-apart relationship, said apex having two end portions and each hand grip being mounted respectively adjacent one of said end portions whereby the patient can grip said pair of hand grips to assist himself onto and off of said knee support, apex of said inverted V-shape, and shoulder supports.

4,170,987

MEDICAL DIAGNOSIS SYSTEM AND METHOD WITH MULTISPECTRAL IMAGING

Victor J. Anselmo, La Canada, and Terrence H. Reilly, La Crescenta, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

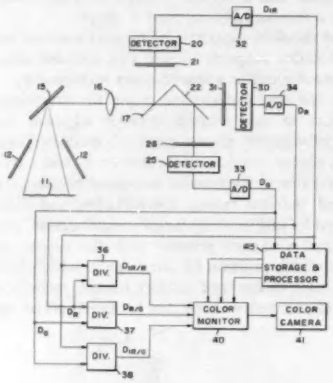
Filed Nov. 28, 1977, Ser. No. 855,364
Int. Cl.[2] A61B *6/00*
U.S. Cl. 128—665 **15 Claims**

1. A system for generating data for use in diagnosing the condition of surface tissue of a patient, comprising:

first means for scanning the surface tissue of a patient and for generating simultaneously n different signals from the light reflected from each incremental area of the surface tissue, each different signal being directly related to the reflectance of light of a different wavelength range from said incremental area, n being an integer not less than 2;

second means for providing a preselected number of derived signals from the n signals, associated with each incremen-

tal area, each derived signal being a function of at least two of said n signals; and



output means including at least means responsive to said derived signals for providing output data, indicative of the surface tissue condition.

4,170,988

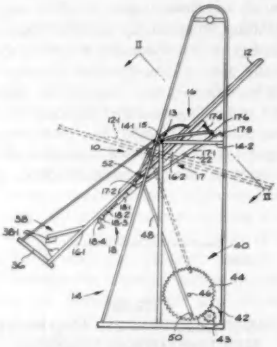
THERAPEUTIC APPARATUS

Nicolaas J. P. R. Krause, 35 Machine St., Elsburg, South Africa

Filed Nov. 7, 1977, Ser. No. 849,297

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—24 R **15 Claims**



1. A therapeutic apparatus including a support, an elongate planar platform for supporting a person in a reclining position, the platform being pivotally mounted on a fulcrum on the support so as to be pivotally displaceable about a pivotal axis transverse to the longitudinal direction of the platform, the support being adapted to support the fulcrum in a sufficiently elevated position so that the platform can pivot between one extreme position in which it is in a substantially upright position and another extreme position in which it is in a substantially upright inverted position, and adjustment means for adjusting the platform with respect to the fulcrum in at least two directions transverse to one another, at least one direction being transverse to the plane of the platform, and the adjustment means for adjusting the platform in at least one direction being infinitely angularly adjustable.

4,170,989

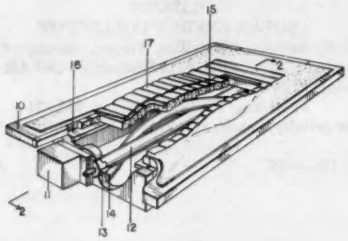
MASSAGING APPARATUS

Jack K. Miniere, Winter Park, Fla., assignor to Herbert Geartner, Orlando, Fla.

Filed Nov. 21, 1977, Ser. No. 853,022

Int. Cl.[2] A61H *7/00*

U.S. Cl. 128—52 **11 Claims**



1. A massage apparatus comprising in combination:

a frame;

an electric motor attached to said frame;

an elongated cam rotatably connected to said frame and rotatably connected to said electric motor for rotation thereby;

a plurality of slats movably mounted transverse to said elongated cam and adjacent thereto whereby rotation of said elongated cam will raise and lower said slats responsive to said cam;

flexible material attached to said frame and covering said slats to hold said slats adjacent to said elongated cam; and

an elongated ledge attached to said frame which supports each end of each of said slats on one side, while said flexible material cover supports the slats on the other side thereof.

4,170,990

METHOD FOR IMPLANTING AND SUBSEQUENTLY REMOVING MECHANICAL CONNECTING ELEMENTS FROM LIVING TISSUE

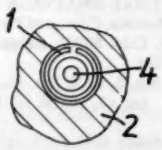
Frank Baumgart, Ratingen, Fed. Rep. of Germany; Günter Bensmann, Essen; Jörg Haasters, Essen; Jürgen Hartwig, Essen; Joachim Jorde, Essen; Manfred Müller, Essen, and Karl F. Schlegel, Essen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 873,052

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703529

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—92 B **3 Claims**



1. A method of implanting and subsequently removing mechanical connecting elements from living tissue comprising: providing a connecting element which is formed from the group consisting of a Ni-Ti or a Ti-Nb alloy material which exhibits a memory effect due to heating to a temperature above a material specific temperature and which has been plastically deformed; implanting the connecting element; thereafter heating the connecting element to a temperature sufficient to actu-

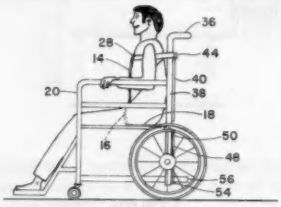
ate the memory effect to cause the element to assume substantially its shape prior to being plastically deformed and to provide the desired connection between portions of living tissue; upon completion of the healing process for the living tissue, cooling the implanted connecting element to a temperature below that which actuates the opposite memory effect to return the implanted connecting element to substantially its shape upon implantation; and then removing the connecting element.

4,170,991

SEAT BIB

Harry Y. Kella, 6316 Mesita Dr., San Diego, Calif. 92115

Filed May 10, 1977, Ser. No. 795,516
Int. Cl.[2] A61F 5/37
U.S. Cl. 128—134 **3 Claims**



1. The combination of a wheel chair having a frame with a seat and including opposing upright members with a back rest therebetween and terminating in handles, and rearwardly extending pedal elements used in tipping the wheel chair, and a seat bib for use of a patient seated in the wheel chair, said bib comprising:

(a) a front panel dimensioned and configured to extend over the chest and abdomen of the patient;

(b) a seat panel, generally horizontally disposed in use, to extend over a portion of the seat under a patient;

(c) a crotch panel of reduced width intermediate and joining said front and seat panels;

(d) said front panel having means at the distal end thereof for attachment to a wheel chair comprising a belt secured thereto and having a plurality of open link portions spaced apart longitudinally of the belt at one end thereof, said link portions being capable of being selectively passed over one of the handles of the wheel chair so that said belt is adjustably positionable upon the corresponding one of the upright lateral members of the wheel chair above the back rest of the wheel chair, said belt having, on the other end portion thereof, a returned portion capable of being passed around the other of the upright members of the wheel chair, and means for adjusting the effective length of said other end portion; and

(e) said seat panel having means for attachment of the distal end thereof to said wheel chair comprising a pair of straps, each strap having a plurality of integral loop portions spaced therealong, said loop portions being selectively engageable onto said rearwardly extending pedal elements used in tipping the wheel chair wherein said straps include branched bridle portions at the proximal ends thereof for more wrinkle-free deployment of said seat panel.

4,170,992

FIDUCIAL POINT LOCATION

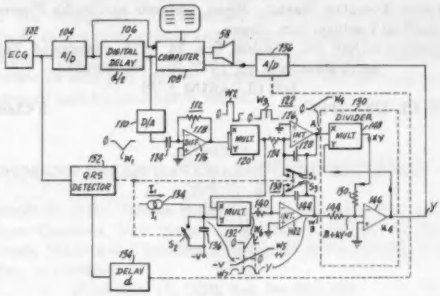
Richard F. Dillman, Lexington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 5, 1978, Ser. No. 867,265
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—702 **5 Claims**

1. In a patient monitoring system having an input to which signals derived from an ECG machine that represent the heartbeat cycle of a patient may be applied, the combination of

means coupled to said input for giving information as to the location of a fiducial point in the signal representing each heartbeat cycle, said fiducial point being located at the centroid,

memory means for storing one of said signals and information as to the location of its fiducial point,



means for matching unknown signals representing heartbeat cycles with the one said heartbeat cycle that has been stored in such manner that their respective fiducial points are in time coincidence so as to provide at its output information as to the degree of correlation between each received signal and the said signal stored in said memory means, and

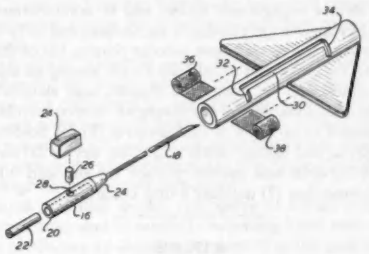
means coupled to the output of said matching means for producing one indication when the unknown signal is ectopic and another indication when it is not ectopic.

4,170,993

SLIDING I.V. NEEDLE CARRIER ASSEMBLY

Marcial Alvarez, 225 E. Jersey St., Elizabeth, N.J. 07206

Filed Mar. 13, 1978, Ser. No. 885,553
Int. Cl.[2] A61M 05/00
U.S. Cl. 128—214 R **7 Claims**



1. An I.V. needle carrier assembly, comprising in combination:

a delta-shaped base plate;

an I.V. needle carrier-receiving barrel being secured to said base plate, and extending along the axis of symmetry thereof, the forward open end of said barrel residing at the apex of said delta;

an I.V. needle carrier being slidingly received within said barrel, said carrier having a needle mounted thereon;

means for sliding said needle carrier between a rearward position at which the tip of said needle is axially retracted within said barrel, and a forward position at which said needle tip is fully extended through said front open end of said barrel, whereby said needle may be inserted into the blood vessel of a patient locking means for maintaining said carrier in at least the forward position; and

adhesion means on the wing-like portions of said delta-shaped plate to alternate sides of said barrel, for anchoring said plate to the skin of said patient upon said needle being received into said blood vessel.

4,170,994

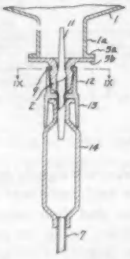
PLASTIC CONTAINERS FOR PARENTERAL SOLUTIONS

Kyoichi Komatsu, Naruto, Japan, assignor to Otsuka Pharmaceutical Factory, Inc., Japan

Division of Ser. No. 616,266, Sep. 24, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 806,064

Int. Cl.[2] A61M *5/16*

U.S. Cl. 128—214 C **5 Claims**



1. An administration device comprising, a plastic parenteral solution container (1) including a tubular container body having parenteral solution therein and being sealed around its periphery and having a small tubular extension (2) projecting outwardly from the bottom end thereof, said tubular extension (2) having a closed outer end and having at least two substantially parallel spaced encircling grooves (9,4) arranged in spaced relationship to the outer end thereof, one of said grooves closest said outer end defining a reduced wall thickness (4) for easy severance across said groove (4) to form a tubular portion (2) with an open passage (2*b*) therethrough for opening the tubular extension for removal of the solution from the container (1), another of said grooves (9) defining a dispensing device engagement recess, and an administration device (5) having one top elastically expandable end to be liquid-tightly connected to said open tubular portion (2) of the container (1), the other end of said device (5) having an injection needle connection (7) connected thereto, said elastically expandable end of said device (5) having an interior annular bead (10) engaged to said one of said grooves (9) for holding said device (5) to said tubular portion (2), said device (5) having a chamber between said tubular portion (2) and said injection needle connection (7) defining a drip chamber.

4,170,995

CATHETER CLAMP

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Filed Nov. 21, 1977, Ser. No. 853,321

Int. Cl.[2] A61B *17/00*

U.S. Cl. 128—346 **10 Claims**

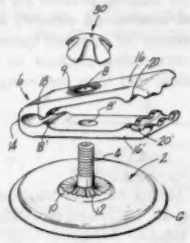
1. A catheter tube holder comprising:

(a) adhesive-coated base means for securing the holder to the skin of a patient;

(b) jaw means mounted on said base means for free rotational movement with respect to said base means, said jaw means being operable to receive a catheter tube;

(c) adjustment means for acting upon said jaw means to cause the latter to grip the catheter tube with a clamping action to prevent the catheter tube from moving longitudinally with respect to said jaw means; and

(d) locking means responsive to actuation of said adjustment means to lock said jaw means against rotation with respect



to said base means when the catheter tube is clamped by said jaw means.

4,170,996

CATHETERIZATION UNIT

Yeongchi Wu, Darien, Ill., assignor to Rehabilitation Institute of Chicago, Chicago, Ill.

Filed Nov. 3, 1977, Ser. No. 848,005

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—349 R **8 Claims**

1. A reuseable catheter unit including a catheter member of a predetermined diameter through a substantial part of its extent and having a closed anterior end, at least one side port adjacent said anterior end which communicates with a lumen passing through the remainder of said catheter member, an enlarged distal end having a large diameter portion connected by a tapered wall portion to the predetermined catheter member diameter, aperture means on said tapered wall portion communicating between the interior and exterior of said tapered wall portion, flexible sleeve means connected at one end to said large diameter portion and encasing said catheter member throughout all of its length and hollow tubular connector means positioned at the opposite end of said sleeve means, said tubular connector means axially spaced from the anterior end of said catheter member and further including a bore greater than said predetermined diameter, said connector means and said enlarged distal end of the catheter member having cooperative means for sealingly connecting to one another when said sleeve and the catheter member contained therein are formed into a circle thereby forming a closed ring capable of sealingly retaining an antiseptic fluid within the lumen of the sleeve and the exterior and lumen of said catheter member for aseptic storage between catheterization procedures.

4,170,997

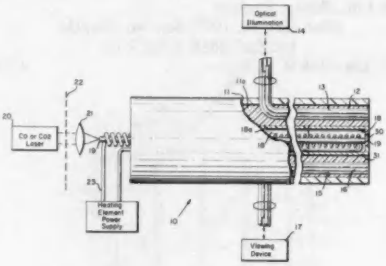
MEDICAL LASER INSTRUMENT FOR TRANSMITTING INFRARED LASER ENERGY TO A SELECTED PART OF THE BODY

Douglas A. Pinnow, Pacific Palisades, and Anthony L. Gentile, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 26, 1977, Ser. No. 827,923

Int. Cl.[2] A61B *17/36;* **A61N** *3/00*

U.S. Cl. 128—395 **7 Claims**



1. In a medical laser instrument having an output end for transmitting laser energy to a selected part of the body, the improvement comprising:

(a) fiber optic waveguide means comprising a polycrystalline halide of a metal, enclosed in said instrument for transmitting an infrared laser beam for performing operations on a selected part of the body with infrared radiation and for transmitting a visible laser beam,

(b) an infrared laser coupled to said fiber optic waveguide means,

(c) a low power laser having an output wave-length in the visible region of the spectrum and coupled to said fiber optic waveguide to provide a visible indication on said selected part of the body of a point at which infrared radiation from said waveguide will be applied, and

(d) a diamond window inert to body fluids, sealed to the output end of said instrument for transmitting radiation from both said infrared laser and said low power laser and for isolating said polycrystalline halide from the body.

4,170,998

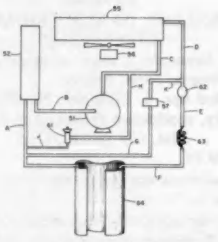
PORTABLE COOLING APPARATUS

James W. Snuder, San Ysidro, Calif., assignor to Chattanooga Pharmacal Company, Chattanooga, Tenn.

Continuation-in-part of Ser. No. 616,909, Sep. 26, 1975, Pat. No. 4,026,299. This application Sep. 30, 1976, Ser. No. 728,262

Int. Cl.[2] A61F *7/00*

U.S. Cl. 128—400 **15 Claims**



1. A portable apparatus for cooling a limb of a patient or the like and comprising a compressor, a condenser, expansion valve means, at least one flexible pad adapted to be wrapped around a bodily limb and including flexible tubing serving as an evaporator, an auxiliary evaporator, conduit means for circulating a refrigerant composition serially from said compressor to said condenser, to said expansion valve means, to said tubing, to said auxiliary evaporator and back to said compressor, a by-pass conduit operatively connected to said conduit means and extending from a point downstream of said compressor and upstream of said pad to a point downstream of said pad and upstream of said auxiliary evaporator, and by-pass valve means for selectively opening and closing said by-pass conduit and so that the refrigerant composition will flow concurrently through the by-pass conduit and through the flexible tubing of said pad when said by-pass conduit is open, whereby the temperature of said pad may be controlled by the opening and closing of said by-pass valve means.

4,170,999

DEMAND PACER HAVING REDUCED RECOVERY TIME

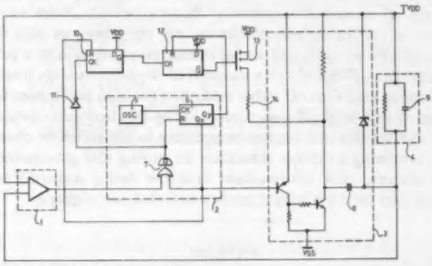
Kenneth R. Allen; Dennis Digby, both of Brooklyn Park, and Alan Coombes, New Hope, all of Minn., assignors to Biotronik Mess- und Therapiegeräte GmbH & Co., Berlin, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 917,131

Claims priority, application United Kingdom, Aug. 19, 1977, 34915/77

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG **4 Claims**



1. Demand-type cardiac stimulating apparatus comprising:

(a) electrode means for coupling stimulating pulses to the heart;

(b) an output amplifier stage for generating stimulating pulses for the heart, said output stage having an output capacitor connected to said electrode means, said output stage having an output impedance recovery interval established, after each stimulating pulse generation, in substantial part by the accumulation and subsequent dissipation of charge on said output capacitor;

(c) input amplifier means, responsive to signals from said output stage and to naturally occurring heart beat signals, for producing a control signal relative to the generation of a next subsequent stimulating pulse;

(d) logic means, responsive to said control signal, for selectively energizing said output amplifier to generate a stimulating pulse based on predetermined demand pacing criteria;

(e) and the improvement comprising means for shortening said recovery interval including

(i) first bistable means, conditioned to a first enabling output state by said logic means at a predetermined time after each said selective energizing;

(ii) second bistable means, clocked to an enabling output state by said enabling state of said first bistable means, said enabling output state of said second bistable means being terminated by said logic means after a second predetermined duration, said second duration defining a reduced recovery interval of said output stage, and

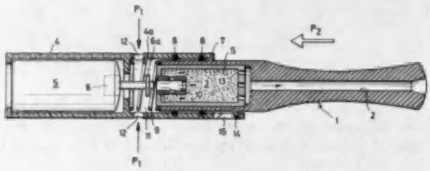
(iii) transistor means, responsive to said second bistable

means and energized during said second duration, for dissipating charge on said output capacitor, and thereby establishing a shortened recovery interval for said output stage.

4,171,000
SMOKING DEVICE

Klaus P. Uhle, Pfitznerstr. 13, D-8070 Ingolstadt, Fed. Rep. of Germany

Filed Mar. 23, 1977, Ser. No. 780,539
Int. Cl.[2] A24F *47/00*
U.S. Cl. 131—170 A **9 Claims**

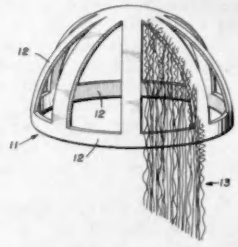


1. A smoking device for aspirating a gas-containing mixture comprising a mouthpiece with at least one suction duct connected to an air-aspirating chamber, a pressure vessel filled with said mixture attached to said air-aspirating chamber and including an outlet valve being biased into closed position and connected to said air-aspirating chamber which outlet valve has to be opened to put the device into operation, an inlet for atmospheric air into said air-aspirating chamber which is provided with a shut-off valve coupled to the outlet valve, means for biasing said shut-off valve into open position and means for bringing said shut-off valve into closing position and opening said outlet valve and further comprising an intermediate chamber containing a storage substance for storing said gas-containing mixture, said intermediate chamber being disposed between said air-aspirating chamber and said mouthpiece.

4,171,001
METHOD FOR MAKING A WEFT AND A WIG MADE FROM THE SAME

Richard L. Leonard, Decatur, Ala., and Allan D. Chernack, Marlboro, N.J., assignors to Monsanto Company, Decatur, Ala.

Filed Nov. 21, 1977, Ser. No. 853,052
Int. Cl.[2] A41G *3/00*
U.S. Cl. 132—53 **9 Claims**



1. The method of making a weft for use in making a wig, comprising:

a. assembling a blend of modacrylic fibers into a weft of parallel fibers, said blend being made up of (1) 5–50 weight percent of a first modacrylic fiber having a denier of 30 to 50 and a shrinkage of 5–20 percent at a temperature of 120° C. with (2) 95–50 weight percent of a second modacrylic fiber having a denier of 30 to 50 and a shrinkage of at least 5 percent less than the shrinkage of the first fiber at a temperature of 120° C. to form a fiber blend,

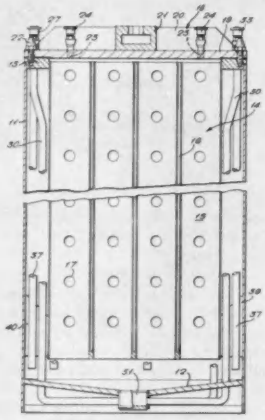
b. sewing the weft across one end to secure the fibers together, and

c. heating the weft to a temperature of 110° to 130° C. for a time period of 1 to 5 minutes to shrink the fibers.

4,171,002
NUCLEAR FUEL TRANSPORTATION CONTAINERS

Alfred J. Smith, Stockport, England, assignor to British Nuclear Fuels Ltd., Risley, England

Filed Oct. 20, 1977, Ser. No. 844,036
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—166 R **4 Claims**



1. An inner container for use inside a transport flask for irradiated nuclear fuel elements, the inner container comprising:

a generally cylindrical shell having a dished closure with a drainage sump at one end,

a detachable lid at the other end,

a partitioning structure defining compartments in the shell each for receiving an elongate nuclear reactor fuel element disposed with axis parallel to the axis of the shell, and

sealable ducts extending through the lid arranged for injecting streams of flushing liquid through the inner container, at least one of the ducts being arranged for discharging matter from the sump through the lid of the inner container.

4,171,003
SOLAR ENERGY TO ELECTRICAL ENERGY CONVERTER

Francis Forrat, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 4, 1978, Ser. No. 893,395
Claims priority, application France, Apr. 5, 1977, 77 10279
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 PC **4 Claims**

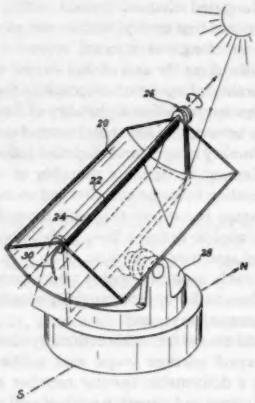
1. A solar radiation energy to electrical energy apparatus comprising,

(a) means for focusing solar radiation to a linear form,

(b) an optical frequency converter plate of transparent material for optical conversion of solar radiation to infrared radiation, said plate positioned adjacent the said focusing means and receiving radiation therefrom, the said frequency converter plate performing the additional function of guiding solar radiation incident thereon to one longitu-

dinal edge of said plate, said one longitudinal edge being parallel to the linear form of the focused radiation,

(c) a multijunction, semiconducting rod comprising a plurality of photovoltaic diodes, the junction planes of which are at right angles to the axis of the rod, said rod being positioned along said one of the longitudinal edges of said converter plate, said diodes being illuminated by solar radiation in a direction substantially parallel to the junc-



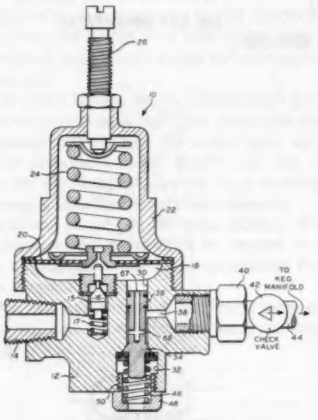
tions by the solar radiation which has passed through the converter plate and has been guided to said one longitudinal edge of the converter plate.

4,171,004

SAFETY REGULATOR FOR FLUID PRESSURE

Vincent Cerrato, Pomona, and James Hines, Port Jervis, both of N.Y., assignors to Vending Components, Inc., Hackensack, N.J.

Filed Jul. 13, 1977, Ser. No. 815,267
Int. Cl.[2] G05D *16/06*
U.S. Cl. 137—116 **10 Claims**



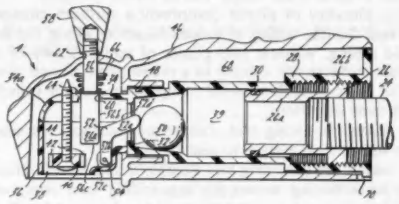
1. A safety device for supplying gas under controlled pressure including in combination a source of gas under said controlled pressure, a delivery line through which the gas flows to apparatus in which the gas pressure is used to maintain pressure in a beer keg or the like, an automatic pressure-relief valve that vents excess gas to the ambient atmosphere, a passage through which the pressure-relief valve is in communication with the source of gas, a valve seat at the end of said passage and against which the pressure relief valve seats when in closed position, means holding the pressure-relief valve closed in contact against said seat at pressures below a predetermined maximum, a motion transmitting connection operated by the pressure-relief valve, a safety shut-off valve movable into position to stop flow of gas from the source of gas pressure to said delivery line when excessive gas flow to the pressure relief valve is greater than the rate at which the gas can be vented by the pressure relief valve and gas pressure builds up in the delivery line, the safety shut-off valve being connected with said motion transmitting connection and operated thereby to close the safety shut-off valve when the pressure-relief valve is moved into an open position by said excessive gas flow, and a check valve in position to prevent back flow of gas from said beer keg through said delivery line.

4,171,005

DIVERTER TUB SPOUT

James R. Nicklas, Greensburg, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.

Filed Apr. 3, 1978, Ser. No. 892,936
Int. Cl.[2] A47K *3/22*
U.S. Cl. 137—119 **5 Claims**



1. A diverter tub spout including housing means defining a water passage therethrough and having an input opening for interconnection with a source of water under pressure and a water discharge opening remote from said input opening, a portion of said housing means between said input and discharge openings defining a partial restriction in said passage of reduced cross-sectional area and comprising a valve seat, a valve member freely positioned in said passage between said seat and said input opening and movable in response to the force of pressurized water in said passage to abut said seat and block said passage against the flow of water therethrough, an elongate stem extending through said housing means from said passage to the exterior of said housing means and being movable along its length, a valve control member within said passage and having a pair of angularly disposed elongate arms, one of said arms being pivotally secured to said housing such that said control member is movable between a first control member position wherein the other of said arms is positioned in a location between said valve member and said seat to maintain said valve member remote from said seat against the force of water pressure in said passage to permit water flow therethrough and a second control member position remote from said location and permitting said valve member to abut said seat to block said passage, said elongate stem being movable to a first stem position to contact and maintain said control member in the first control member position, and wherein the contact between said stem and control member occurs along an elongate dimension of said stem such that the force of water pressure on said valve member is transmitted through said control member to said stem and acts on said stem in a direction perpendicular to the path of movement of said stem.

4,171,006

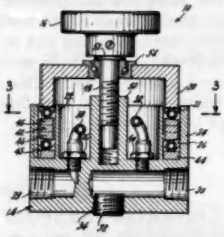
FLUID METERING VALVE

Robert E. Steere, Jr., Boonton, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Filed Oct. 11, 1977, Ser. No. 840,781

Int. Cl.[2] F16K *7/06*

U.S. Cl. 137—595 **13 Claims**



1. A metering valve for precise control of fluid passing therethrough comprising:

(a) a body having a tubing receiving channel formed therein;

(b) a length of flexible tubing positioned within said channel and extending along substantially the entire length of said channel from an inlet location to an outlet location;

(c) a plurality of planar compression surfaces engageable with said flexible tubing at spaced locations along the length of said tubing, wherein said planes of said plurality of compression surfaces are oblique to a radial plane of said channel and the plane of each adjacent compression surface is inclined in the same direction;

(d) means mounting said compression surfaces for simultaneous movement relative to said tubing;

(e) means for centering said flexible tubing in said channel;

(g) an actuating means for controlling said compression surface movement means to progressively constrict flow of liquid in said tubing if said compression surfaces are moved into compressive engagement with said tubing and to progressively open flow of fluid as said compression surfaces are moved out of engagement with said tubing.

2. A metering valve as recited in claim **1** wherein said body is comprised of a first portion wherein said tubing receiving channel is an annular channel formed therein, and a second cylindrical portion moveable axially upwardly and downwardly relative to said first body portion and receivable in said annular channel of said first body portion.

4,171,007

UNIDIRECTIONAL FLOW LIMITER

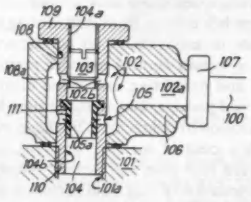
Daniel Bouteille, Marnes-la-Coquette, France, assignor to Societe Anonyme: La Telemecanique Electrique, France

Filed Mar. 3, 1977, Ser. No. 774,311

Claims priority, application France, Mar. 5, 1976, 76 06384; Mar. 5, 1976, 76 06385

Int. Cl.[2] F16K *11/10, 15/14*

U.S. Cl. 137—599 **4 Claims**



1. A right angle connection element for connection between a fluid pipe and a user apparatus, comprising:

a first elongated element having an axis and an elongated internal first cavity disposed substantially along the axis of said first element, having means for connecting said first cavity to said fluid pipe to define a flow path between said first cavity and said fluid pipe, and having a bore passing through said first element and through said first cavity, said bore having an axis which is substantially perpendicular to the axis of said first element;

a second elongated element housed within said bore and exposed to said first cavity, said second element having an axis and an elongated internal second cavity disposed substantially along the axis of said second element, having a first plurality of apertures disposed radially around said second element to define a plurality of first passage ways extending between said first and second cavities, having a second plurality of apertures disposed radially around said second element to define a plurality of second passage ways extending between said first and second cavities, and having means for connecting said second cavity to said user apparatus to define a flow path between said second cavity and said user apparatus;

means adjustably mounted within said second cavity of said second element for at least partially closing said plurality of first passage ways; and

unidirectional means for unidirectionally closing said plurality of second passage ways, said unidirectional means including a deformable annular member attached to said second element and covering each of said second plurality of apertures.

4,171,008

APPARATUS FOR DETECTING MALFUNCTION ON DRAWING OF CATCH YARNS IN A SHUTTLELESS LOOM

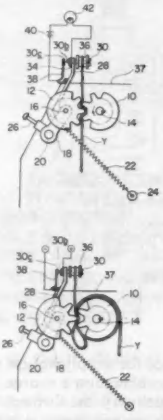
Kimimasa Onishi, Tokyo; Eiji Ichimatsu, Koganei; Mamoru Nagashima, Tokyo; Junnosuke Suekane, Musashi-murayama, and Mikiyoshi Ogawa, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 12, 1978, Ser. No. 895,613

Claims priority, application Japan, May 26, 1977, 52-66925[U]

Int. Cl.[2] D03D *51/18*

U.S. Cl. 139—339 **6 Claims**



1. In a shuttleless loom having a weft catching arrangement of the type including a plurality of catch yarns disposed on one side of an array of warp yarns for grasping an inserted weft yarn and catch yarn drawing means for drawing said catch

yarns at a predetermined rate, said catch yarn drawing means having a pair of rotatable members cooperative to nip said catch yarns between their peripheries and draw same when driven to rotate in opposite directions of rotation, an apparatus for detecting malfunction on drawing of said catch yarns comprising:

mounting means for mounting said pair of rotatable members in such a manner as to permit relative movement between them toward and away from one another;

biasing means for yieldably urging said pair of rotatable members together to produce a yarn drive pinch; and

detecting means for detecting the relative movement between said pair of rotatable members away from one another and producing an alarm-signal upon detection of said relative movement reaching a predetermined increased value.

4,171,009

FORMING FABRICS FOR PAPER-MAKING MACHINES AND METHODS OF MANUFACTURE THEREOF

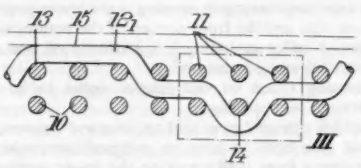
Robert Karm, Selestat, France, assignor to Etablissements Martel, Catala & Cie S.A., Selestat, France

Filed Mar. 22, 1977, Ser. No. 780,249

Claims priority, application France, Apr. 2, 1976, 76 09744

Int. Cl.[2] D03D *15/00, 15/02;* **B21F** *1/10;* **B10D** *39/08*

U.S. Cl. 139—425 A **16 Claims**



1. Endless forming fabric for paper-making machine and the like, comprising:

an upper layer of threads transverse to the direction of movement of the fabric on the machine and located on the material forming side of the fabric,

a lower layer of threads transverse to said direction of movement and located on the wear side of the fabric,

and longitudinal threads interwoven with the layers of transverse threads,

wherein all loops formed by the longitudinal threads over the transverse threads of the upper layer bind with from 3 to 7 transverse threads of the upper layer and the first points of crossing of such loops with the transverse threads are distributed according to a weaving pattern comprising at least five longitudinal threads,

and the weaving pattern on the outer surface of the fabric which supports the material to be formed is of a type without alignments of said loops on adjacent threads and without diagonal effects,

and wherein the longitudinal threads form loops each binding with one transverse thread of the lower layer on the wear side of the fabric.

4,171,010

FLAPPER RETRACTOR

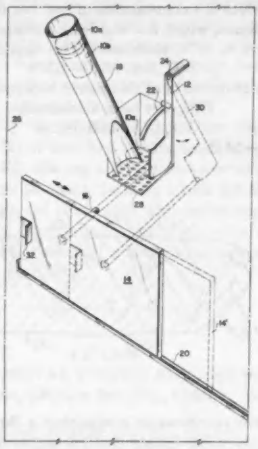
Carmine Deer, Westfield, N.J., assignor to Flagstaff Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,286

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—369 **6 Claims**

1. A cup dispensing apparatus comprising a cup support, cup dispensing means for dispensing a cup onto said support, a cup stabilizing flapper for stabilizing said cup on said support, said flapper being movable from a first cup stabilizing position to a second position remote therefrom, an access door, and means responsive to the opening of said door for moving said flapper from said first position to said second position, whereby said



cup may be removed without interference from or contact with said flapper.

4,171,011

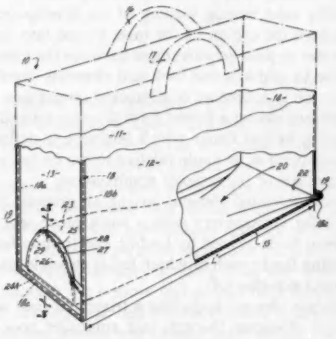
HANDBAG

Sheldon A. Kopin, Cincinnati, Ohio, assignor to 'Totes', Incorporated, Loveland, Ohio

Filed Aug. 2, 1978, Ser. No. 930,137

Int. Cl.[2] A45C *13/40*

U.S. Cl. 150—34 **6 Claims**



1. A handbag comprising

opposed side walls, opposed end walls, and a floor, said end walls being stitched to at least one of said side walls and said floor, and

an umbrella compartment located adjacent the floor of said handbag, one end of said umbrella compartment opening in a mouth in one end wall of said handbag, and the other end of said compartment being stitched closed, and said other end of said compartment being connected to said handbag, by that same stitch line which connects the other end wall with one of a side wall and said floor.

4,171,012
LOCKING THREAD CONSTRUCTION

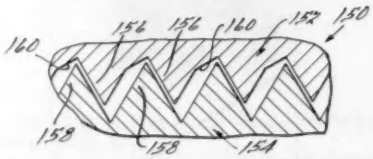
Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48024

Continuation-in-part of Ser. No. 770,411, Feb. 18, 1977, abandoned, which is a continuation of Ser. No. 635,217, Nov. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 620,566, Oct. 8, 1975, abandoned. This application Nov. 15, 1977, Ser. No. 851,759

The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.

Int. Cl.[2] F16B *39/30*

U.S. Cl. 151—14 R 10 Claims



1. A fastener combination comprising a threaded male element and a threaded female element adapted to receive the male element in threaded engagement therewith;

each of the male and female threaded elements having a thread form thereon defined by leading and trailing helical flanks which intersect to define a crown, each flank lying at an angle relative to the common longitudinal thread axis of the fastener combination;

the female element including a truncated root adjacent the major diameter thereof, said truncated root defining a helical flat extending between the trailing flank and the adjacent leading flank which faces said trailing flank, and said flat, throughout its axial extent lying at an angle between about 15° and 45° relative to the thread axis which is substantially less than the angle of the male element flank which tends to converge on said flat under axial tension load, said flat angled radially outward from said trailing to said adjacent leading flank;

whereby axial tension loading of the combination tends to displace the crown of the male thread into contact with the flat to prevent movement between the elements transverse to said axis and lock said elements together.

7. For use in a fastener combination comprising a threaded male element having a thread form thereon defined by leading and trailing helical flanks which intersect to define a crown, each flank lying at an angle relative to the common longitudinal thread axis of the fastener combination;

a female threaded element having an external bearing surface for engagement with a work piece and an internal thread form defined by leading and trailing helical, intersecting flanks each of which lies at an angle relative to the thread axis thereof;

the female element including a truncated root adjacent the major diameter thereof, said truncated root defining a helical flat extending between the trailing flank and the adjacent leading flank which faces said trailing flank, and said flat, throughout its axial extent, lying at an angle between about 15° and 45° relative to the thread axis which is substantially less than the angle of the male element flank which tends to converge on said flat under axial tension load, said flat angled radially outward from said trailing to said adjacent leading flank;

whereby, when in the combination, axial tension loading tends to displace the crown of a male thread into contact with the flat to prevent movement between the elements transverse to said axis and lock said elements together.

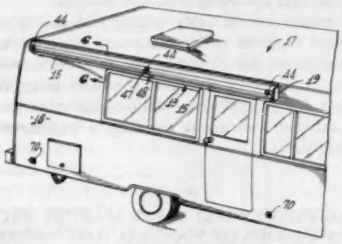
4,171,013
RETRACTABLE AWNING ASSEMBLY

Robert C. Clark, Anaheim, Calif., assignor to A & E Plastik Pak Co., Inc., Industry, Calif.

Continuation-in-part of Ser. No. 705,873, Jul. 16, 1976. This application Jul. 25, 1977, Ser. No. 818,414

Int. Cl.[2] E04F *10/06*

U.S. Cl. 160—22 44 Claims



1. An awning assembly comprising:

an elongated case body having top and back walls, a partial front wall extending downward from the front of said top wall, a partial bottom wall extending forward from the bottom of said back wall, and end plates closing the ends of the body;

said case body having an opening in the lower portion of the front side and the front portion of the bottom side;

a take-up roller extending longitudinally of, and rotatably mounted in, said case body;

an awning rolled on said take-up roller to be extended through said opening;

a lead bar disposed over said opening and cooperating with said case body to form an enclosed case, said lead bar having a front wall covering the lower portion of said front side and a bottom wall covering the front portion of said bottom side;

means for holding said lead bar releasably in place in said case body and permitting movement of the lead bar out of the opening and away from the case body, said awning having one edge connected to the lead bar to be unrolled and extended thereby;

two elongated legs pivotally connected to the lead bar adjacent its opposite ends, and each extending along the bottom of the case toward the center thereof, each of said legs being of flattened generally rectangular cross-sectional shape and having a relatively wide side adjacent the case, said legs also being connected to the lead bar for rotation about an axis extending longitudinally of the leg when the leg is in a released position and extends downwardly from the lead bar;

a leg lock housing disposed between the free ends of said legs and substantially filling the space between them, said housing being of substantially the same cross-sectional shape as said legs to present an appearance of continuity along the case;

means on said leg lock housing for holding the free ends of the legs in the storage position and releasing the legs for movement away from the case for attachment to a vehicle;

said legs being longitudinally extendable and contractable for adjustment of the awning assembly; and

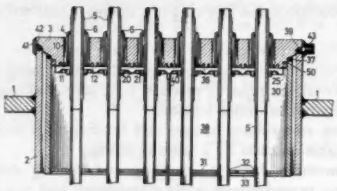
rafters disposed in said case and having inner ends hinged on the case body near its opposite ends, and outer ends hinged on the central portion of said lead bar, said rafters being longtudinally extendable and contractable in response to movement of the lead bar away from and back into the case;

and means operable as an incident to a preselected amount of movement of the lead bar away from the case body to latch said rafters releasably against longitudinal contraction, thereby to brace said lead bar in an extended position.

4,171,014
ARRANGEMENT FOR MOUNTING TUBES IN A TANK WALL

Hermann Straub, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Division of Ser. No. 415,107, Nov. 12, 1973, Pat. No. 3,945,431.
This application Jun. 30, 1975, Ser. No. 592,045
Claims priority, application Switzerland, Nov. 28, 1972, 12278/72
The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.
Int. Cl.[2] F28F *9/04*
U.S. Cl. 165—11 8 Claims

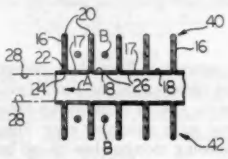


1. The combination comprising
a safety tank wall of a nuclear reactor plant, said wall having an opening therein;
a collar in said opening and secured in gas-tight relation to said wall;
a tube base connected in gas-tight relation to said collar;
a set of tubes extending through and connected with said tube base in gas-tight relation;
a thin sheet-metal membrane peripherally connected with said tube base in gas-tight manner and having said tubes extending therethrough and connected therewith in gas-tight relation, said membrane defining an enclosed gas-tight chamber with said tube base for monitoring the imperviousness of the connections between said tubes and said tube base; and
a sleeve of S-shaped cross-section secured at each end to a respective one of said tubes and said tube base for securing each respective tube to said tube base in spaced relation to each other.

4,171,015
HEAT EXCHANGER TUBE AND METHOD OF MAKING SAME

Charles W. Bucey; Kenneth J. Miller, both of Peoria, and Ronald R. Robinson, Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 28, 1977, Ser. No. 782,200
Int. Cl.[2] F28F *1/26*
U.S. Cl. 165—181 3 Claims

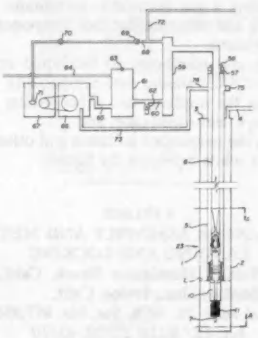


1. A heat exchanger tube (48,68) comprising:
a first asymmetrically corrugated sheet portion (40) having an opposite pair of longitudinally extending side edge portions (32,38,70), a plurality of substantially transversely extending ribs (16), and a plurality of substantially flat members (17) integrally connected to said ribs (16), each rib (16) having a flattened V-shape such that said members (17) define a first plurality of juxtaposed inner surfaces (26);
a second asymmetrically corrugated sheet portion (42) having an opposite pair of longitudinally extending side edge portions (30,38,72), a plurality of substantially transversely extending ribs (16), and a plurality of substantially flat members (17) integrally connected to said ribs (16), each rib (16) having a flattened V-shape such that said members (17) define a second plurality of juxtaposed inner surfaces (26); and
means (50,52,74) for connecting said side edge portions (30,32,38,70,72) of said first and second corrugated sheet portions (40,42), spacing said first and second plurality of inner surfaces (26) apart, forming a tube (46,68) and providing an internal flow path (54) extending generally longitudinally therethrough and a plurality of external flow paths (18) extending generally transversely to said internal flow path (54).

4,171,016
WATER REMOVAL SYSTEM FOR GAS WELLS

Edward A. Kempton, 336-41st Ave. NE., Calgary, Alberta, Canada

Filed Feb. 6, 1978, Ser. No. 875,244
Claims priority, application Canada, Dec. 19, 1977, 293399
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—68 7 Claims

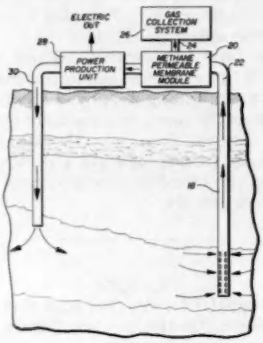


1. A water removal pump system for use in a gas producing well of the type including a casing defining the wall of the well, a cap on said casing defining the well head, and perforations in said casing near the bottom end thereof for introducing a well fluid comprising gas, water, or mixtures thereof into the casing, said system comprising inlet tubing within said casing extending from beneath said perforations through said cap at the well head for introducing a drive liquid into the well; outlet tubing within said inlet tubing extending from the well head downwardly beneath the bottom end of said inlet tubing into the casing for carrying said well fluid to the well head; sealing means between the bottom end of said inlet tubing and said outlet tubing for preventing the passage of said well fluid between said inlet and outlet tubing; a first valve in the bottom end of said outlet tubing for admitting said well fluid into said outlet tubing; a foot valve in said outlet tubing above said first valve permitting upward flow and preventing downward flow of said well fluid in said outlet tubing, an ejector device in said outlet tubing above said foot valve for mixing said well fluid with said drive fluid and directing said fluids upwardly to the well head; and pump means for continuously pumping said drive fluid into the space between said inlet and outlet tubing and through said ejector device for mixing with said well fluid to carry said well fluid to the well head.

4,171,017
METHOD OF GAS PRODUCTION FROM GEOPRESSURIZED GEOTHERMAL BRINES

Donald L. Klass, Barrington, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Mar. 30, 1978, Ser. No. 891,507
Int. Cl.[2] B01D *53/22;* **E21B** *39/00, 43/00*
U.S. Cl. 166—266 **13 Claims**



1. A method for separating and recovering methane and other similar fuel components from the liquids in underground fluid zones that exist naturally at high pressures comprising the steps of:

(a) incorporating a gas permeable membrane selective for the methane and other similar fuel components into a gas collection system;

(b) subjecting said membrane to the liquid containing the methane and other similar fuel components;

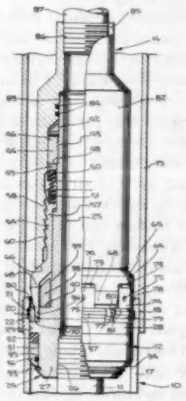
(c) permeating the methane and other similar fuel components through said membrane; and

(d) collecting the permeated methane and other similar fuel components while rejecting the liquid.

4,171,018
TUBING HANGER ASSEMBLY AND METHOD OF LANDING AND LOCKING

Raymond W. Walker, Huntington Beach, Calif., assignor to Deep Oil Technology, Inc., Irvine, Calif.

Filed Mar. 20, 1978, Ser. No. 887,956
Int. Cl.[2] E21B *23/02, 43/10*
U.S. Cl. 166—315 **15 Claims**



5. A tubing hanger means for simultaneous landing and locking in a well member, such as a casing hanger, during longitudinal linear movement of the tubing hanger means relative to said well member, said tubing hanger means being adapted to be connected to a landing tool, comprising in combination:

a tubing hanger body provided with a landing surface;

a radially outwardly biased lock means spaced from said landing surface and carried by said hanger body;

lock sleeve means on said hanger body and adapted to cooperably engage a landing tool;

said hanger body landing surface and said lock means being adapted to be cooperable with landing and locking means on said well member for simultaneous landing and locking of said tubing hanger body with respect to said well member.

12. In a method of installing and retrieving a tubing hanger having a compressible seal ring in a casing means including the steps of:

connecting a tubing string to a tubing hanger;

threadedly connecting a landing tool to said tubing hanger in non-rotatable relative relation with threaded engagement therebetween under tension;

lowering said tubing hanger and landing tool in said non-rotatable relation by a landing string;

simultaneously landing, locking, and sealing said tubing hanger in said casing while maintaining said non-rotatable relation;

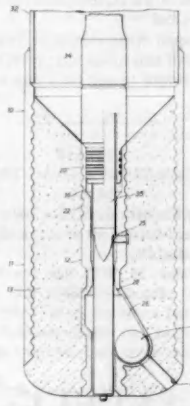
retrieving said landing tool;

said tubing hanger being adapted to be unlocked and retrieved from said casing.

4,171,019
APPARATUS AND METHOD FOR RE-ENTERING AND CEMENTING AN UNDERWATER WELL

Frank Cole, Houston, Tex., assignor to Davis-Lynch, Inc., Houston, Tex.

Filed Jan. 12, 1978, Ser. No. 868,823
Int. Cl.[2] E21B *7/12*
U.S. Cl. 166—341 **9 Claims**



1. A re-entry cementing float shoe comprising an inner cylindrical housing member and an outer cylindrical housing member in concentric spaced relationship forming an annular space therebetween with a cement core filling said annular space, the inner housing member has its top below the top of the outer housing member, the upper surface of the cement core forms a tapered funnel, sloping inwardly and downwardly, the bottom of the funnel ending at the top of the inner housing member and the top of the funnel ending at the inner surface of the outer housing member, the top of the outer housing member is equipped with a casing attachment means capable of attaching to a casing pipe string, the top of the inner surface of the inner housing member forms a female stab-type pipe string attachment means, below said stab-type attachment

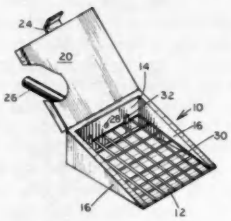
means within the inner housing member is a pump-down latch acceptor means forming part of the inner housing bore consisting of a shoulder means sloping inwardly and downwardly, followed by a plurality of threads, followed by a smooth section, the threads being capable of interacting and holding a pump-down latch plug and the smooth section being capable of sealingly contacting with a pump-down latch plug, below said pump-down latch plug means is a sonar/TV camera seating means and a sonar/TV camera anti-rotational means, also below said pump-down latch plug means is a valve means forming part of the inner housing bore consisting of a second shoulder means sloping outwardly and downwardly forming the top of a side-pocket ball valve housing having within it a ball valve, the side pocket extends downwardly and outwardly from the side of the inner housing member to a depth at least equal to the diameter of the ball valve, the side pocket is equipped with a conduit means forming a drain means extending from the bottom of the side pocket communicating at all times with the space outside of the shoe, the density of the ball valve being greater than water and less than the cement to be used with the shoe.

4,171,020

CHARCOAL EXTINGUISHER

Richard Leporati, R.D. #2, Box 341, Stevens Pl., Chester, N.Y. 10918

Filed Feb. 6, 1976, Ser. No. 655,821
Int. Cl.² A62C *39/00*
U.S. Cl. 169—49 **7 Claims**



1. A charcoal extinguishing device, comprising a scoop shaped member having a triangular cross section and including a base having a planar outer wall and inclined inner wall forming a wedge, a pair of opposing substantially parallel side walls and a rear wall communicating with said base and said side walls and being substantially perpendicular thereto, a movable cover section adapted to cover said member and being pivotally engaged to said rear wall and adapted to move upward and downward relative to said base, a perforate plate disposed in said member and engaging said rear wall for supporting said coals and being inclined relative to said outer wall and rear wall, said plate and said base defining a hollow area therebetween for supporting ash that passes through said plate, said cover, side walls and base including heat insulating material.

4,171,021

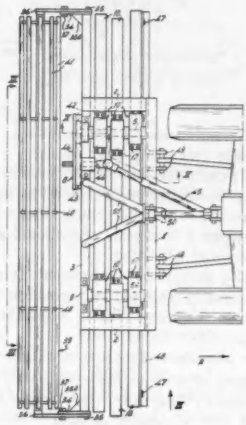
SOIL CULTIVATING IMPLEMENTS

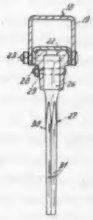
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Oct. 13, 1977, Ser. No. 841,971
Claims priority, application Netherlands, Oct. 15, 1976, 7611397; Oct. 15, 1976, 7611398
Int. Cl.² A01B *19/06, 23/02*
U.S. Cl. 172—63 **19 Claims**

1. A soil cultivating implement comprising a frame and a plurality of elongated, side-by-side beams supported on said frame, said beams each having tine means and extending transverse to the direction of travel, said beams being interconnected to the frame with respective eccentric mechanisms on spaced apart rotatable shafts of driving means, said rotatable shafts extending generally horizontal and in the normal direction of travel, said beams being moved through generally circular paths about said shafts, the opposite ends of at least one of said shafts being rotatably supported from corresponding frame beams that extend transverse to the direction of travel, the rear end of said one shaft being journalled in a gear box and having a toothed pinion of a speed-increasing step-up transmission, said pinion being in driven connection with a larger toothed pinion mounted on a rotary driving shaft of said driving means.

9. A soil cultivating implement comprising a frame and a plurality of elongated, side-by-side beams supported on said frame, said beams each having tine means and extending transverse to the direction of travel, said beams being interconnected to the frame with respective eccentric mechanisms on spaced apart rotatable shafts of driving means, said rotatable shafts extending generally horizontal and in the normal direction of travel, said beams being moved through generally circular paths about said shafts, the longitudinal axes of said shafts being substantially parallel to one another and the respective eccentric mechanisms on said shafts that correspond to each beam occupying corresponding positions as regard their eccentricities on the shafts, each beam comprising two further beams of channel-shaped cross-section and an inner one of the two beams being nested inside the other, said inner beam having limbs with lengths about one third that of the limbs of other beam.



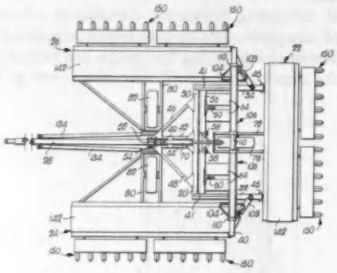


4,171,022

FOLDABLE CONSTRUCTION FOR AGRICULTURAL IMPLEMENTS

Roy E. Applequist, Salina, Kans., assignor to Great Plains Manufacturing Incorporated, Assaria, Kans.

Filed Sep. 26, 1977, Ser. No. 836,719
Int. Cl.[2] A01B *73/00*
U.S. Cl. 172—311 **8 Claims**



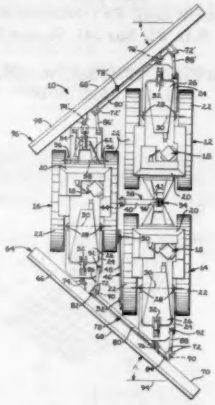
1. A foldable implement carrier including:
a longitudinally extending, draft frame;
a transversely extending, substantially horizontal, implement supporting, center frame connected to said draft frame;
means connected with said center frame for shifting the latter between a lowered, operational condition and a raised, transport condition;
a substantially horizontal, implement carrying, outrigger section normally disposed in a position extending transversely from said center frame when the latter is in said lowered condition thereof; and
hinge means interconnecting said outrigger section with said center frame for substantially horizontal swinging movement of said outrigger section between said transversely extending position thereof and a substantially longitudinally extending position thereof,
said hinge means including hinge structure providing a first zone of hinging and a second zone of hinging above said first zone,
said hinge means cooperating in said first and second zones to suspend said outrigger section in cantilever fashion for maintaining said outrigger section substantially horizontal when said center frame is shifted between its said lowered and said raised conditions thereof,
said hinge structure being operative to allow said outrigger section to also pivot about a substantially horizontal, longitudinally extending axis, and including a hinge section in said second zone having a vertically projecting element secured to one extremity of said outrigger section adjacent said center frame, and control structure mounted on said center frame adjacent said one extremity of said outrigger section,
said control structure including surface areas cooperatively engaging said element to limit the pivotal movement of said outrigger section about said longitudinally extending axis,
at least portions of said control structure including said surface areas being transversely shiftable from a first position in which said surface areas are spaced from said element to allow said pivotal movement of said outrigger section about said longitudinally extending axis when said center frame is in its said lowered condition, to a second position in which said surface areas engage said element for preventing pivotal movement of said outrigger section about said longitudinally extending axis to maintain said outrigger section in a substantially horizontal position when said center frame is shifted from its said lowered condition to its said raised condition,
said control structure including a guide member presenting an open, bounded area through which at least a portion of said element passes,
said guide member functioning to contain the lateral movement of said portion of said element to within said bounded area to limit said pivotal movement of said outrigger section about said longitudinally extending axis,
said guide member including bracket structure forming a generally open triangular shape within which said bounded area is defined,
said surface areas for engaging said element for preventing said pivotal movement of said outrigger section about said longitudinally extending axis being disposed at one apex of said triangularly shaped bracket structure.

4,171,023

TRIPLE TRACTOR ASSEMBLY

James R. Sturges, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1978, Ser. No. 901,039
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—801 **11 Claims**



1. A triple tractor assembly (**10**) comprising:
first, second and third tractors (**12,14,16**) each having a normal longitudinal direction of working movement, said third tractor (**16**) having a side joint (**44**);
first means (**34**) for connecting said first and second tractors (**12,14**) in a longitudinally elongated first row; and
second means (**38**) for laterally connecting said side joint (**44**) of said third tractor (**16**) to one of said first and second tractors (**12,14**) at said first means (**34**), said third tractor (**16**) being arranged in a longitudinally forshortened second row substantially parallel to and adjacent said first row, and substantially longitudinally centered with respect to said first row.

4,171,024

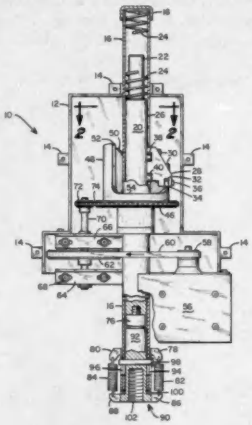
POWER HAMMER

Roger A. Wilson, P.O. Box 23, Clarissa, Minn. 56440

Filed Dec. 29, 1977, Ser. No. 865,746
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—117 **8 Claims**

1. A power hammer comprising in combination:
(a) a housing including an elongated tubular member;
(b) an elongated hammer element disposed in said elongated tubular member for reciprocating motion therein;
(c) a cylindrical cam having a cam profile including a rising portion terminating in an abrupt drop, said cylindrical cam being concentrically mounted for rotation about said tubular member as an axis;

(d) a cam follower assembly connected to said elongated hammer element and cooperating with said cam profile;
(e) a compression spring disposed in said tubular member urging said cam follower assembly against said cam profile;
(f) means offset from the axis of said elongated tubular member for rotating said cylindrical cam about said tubular member;



(g) an anvil element having a tool receiving bore therein; a first portion partially disposed in said tubular member for reciprocating motion therein and adapted to be struck by said hammer element when said cam follower reaches said abrupt drop portion of the cam profile; a second portion extending outward from the end of said tubular member; and tension springs coupled between said portion of said anvil extending outward from the end of said tubular member and said tubular member for urging said anvil toward said hammer element.

4,171,025

HYDRAULIC SHOCK ABSORBING METHOD

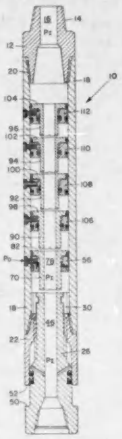
Grey Bassinger, Midland, Tex., assignor to Technical Drilling Tools, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 729,194, Oct. 4, 1976, Pat. No. 4,067,405. This application Dec. 14, 1977, Ser. No. 860,568
Int. Cl.² E21C *7/06*
U.S. Cl. 175—65 **9 Claims**

1. A method for absorbing the shocks in a rotary earth drill utilizing a drill-string and drilling fluid, comprising the steps of:

transmitting downweight from the drill-string and shocks on a rotary drilling bit engaged against the material being drilled to an anvil mounted with a drill-string; and

sequentially transmitting the downweight and shocks from the anvil to a plurality of independently operating hydrau-



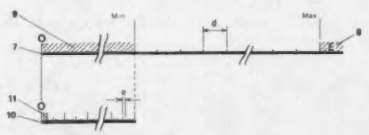
lic pistons when downweight on said drill bit exceeds increasing predetermined amounts for each piston.

4,171,026

SCALE WITH A COMPUTING DEVICE AND A DIGITAL DISPLAY, IN PARTICULAR FOR COMMERCIAL APPLICATIONS

Mario Gallo, and Johannes Wirth, both of Zurich, Switzerland, assignors to Wirth, Gallo & Co., Zurich, Switzerland

Filed Jan. 23, 1978, Ser. No. 871,475
Claims priority, application Switzerland, Jul. 28, 1977, 9330/77
Int. Cl.² G01G *19/04, 7/00*
U.S. Cl. 177—25 **4 Claims**



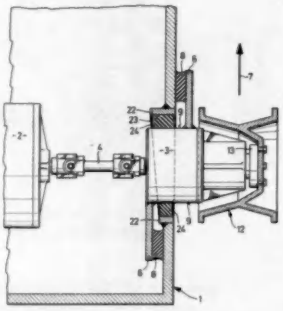
1. In a scale, a computing device, a digital display, a platform for goods to be weighed, a first, a second and a third measuring range, said measuring ranges being nested and each being allocated a given smallest display unit, weights measured in each of said ranges being computed in said computing device and being displayed by said display device with the smallest displayed unit corresponding to that of each of said measuring ranges, the smallest display unit of each of said measuring ranges being at least in the ratio 2:1 compared with that of the next smaller range, first computing and logical means selecting the range in which the goods to be weighed must be measured by said computing device, said selection being made in function of the order of magnitude of the weight of the goods to be weighed, and second computing and logical means establishing in function of said order of magnitude the highest load that may be displayed by said display device.

4,171,027

MOUNTING SYSTEM FOR THE TERMINAL DRIVE OF A TRACKED VEHICLE

Horst Seit, Steinbach, and Eugen Schlegl, Dachau, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 19, 1977, Ser. No. 760,502
Int. Cl.[2] B62D *55/12*
U.S. Cl. 180—9.54 11 Claims



1. A mounting device for the final drive of a tracklaying vehicle having a wall provided with an opening, said final drive extending with clearance through said opening, said mounting device comprising:

means enabling movement of said final drive in said opening in substantially all directions perpendicular to the axis of said final drive with said axis maintained substantially parallel to itself; and

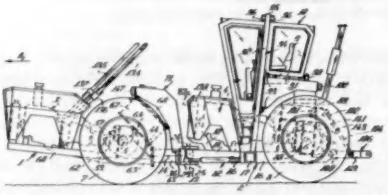
elastic means braced between said wall and said final drive for resiliently resisting said movement, said elastic means extending around the axis of said final drive and having a stiffness which varies in a direction radial to said axis and in a direction parallel to said axis around the periphery of said final drive.

4,171,028

ARTICULATED TRACTOR HAVING TANDEM POWER UNIT

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Oct. 18, 1976, Ser. No. 733,163
Claims priority, application Netherlands, Oct. 16, 1975, 7512129
Int. Cl.[2] B60K *17/30*
U.S. Cl. 180—235 18 Claims



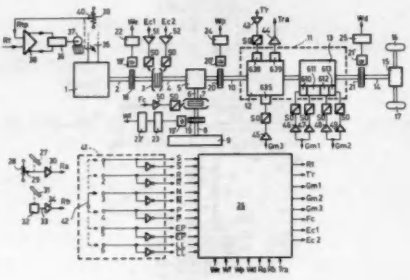
1. A tractor having only two axles with wheels mounted thereon, said tractor comprising a rearward frame portion including one of said axles and a forward frame portion including: the other of said axles; and engine mounted substantially forward of said other axle; a fuel tank mounted substantially behind said other axle; and a shaft for pivotally mounting said forward frame portion to said rearward frame portion about an upwardly directed axis, the center of gravity of said forward frame portion being disposed between said other axle and said upwardly extending axis.

4,171,029

VEHICLE PROPULSION SYSTEM WITH INERTIAL STORAGE

Julian R. A. Beale, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 575,489, May 8, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,356
Claims priority, application United Kingdom, May 10, 1974, 20773/74
Int. Cl.[2] B60K *17/00, 9/04*
U.S. Cl. 180—54 R 3 Claims



1. A propulsion arrangement for a vehicle, comprising

an engine having an output shaft,

a first shaft,

first means for coupling and de-coupling said output shaft to and from said first shaft, in the coupled condition said shafts rotating at a first fixed speed ratio therebetween,

a flywheel,

second means for coupling and de-coupling said flywheel to and from said first shaft, in a coupled condition said flywheel and first shaft rotating at a second fixed speed ratio therebetween,

a variable transmission means having an input connected to said first shaft, and an output,

a vehicle drive shaft connected to the transmission output,

driver operable controls,

means for sensing rotational speeds of said engine, said flywheel, and said drive shaft,

electronic control means responsive to said driver operable controls and speed of said engine, flywheel and the drive shaft for controlling power supplied by the engine and the input/output ratio of the transmission means, and for selectively operating said first and second means for coupling and de-coupling, and

means for applying a small coupling torque between said flywheel and said first shaft when said second means is in a de-coupled condition and said first shaft speed is greater than a predetermined value.

4,171,030

ACCELERATION WARNING DEVICE

Hermann Ruhl, 30 Queen Elizabeth Blvd., Toronto, Ontario, Canada (M8Z 2T6)

Filed Jan. 9, 1978, Ser. No. 868,199
Int. Cl.[2] G08B *19/00*
U.S. Cl. 180—179 10 Claims

1. An acceleration warning and control system for motor driven vehicles having in combination speed measuring apparatus providing an output signal proportionate to and changing with the speed of vehicle, differentiating circuitry providing an output signal corresponding to the rate of change of the output signal from said speed measuring apparatus switch means for indicating an undesirable rate of acceleration and operated by

a predetermined output signal from said differentiating circuitry, control warning means activated by said switch means and an activation switch for activating the system, said activation switch being open during initial acceleration from a standing start and closing to activate the system at a predetermined speed such that the system is only operational at speeds equal to and above the predetermined speed.

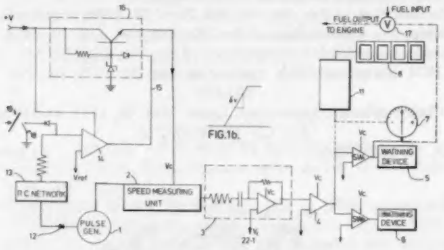


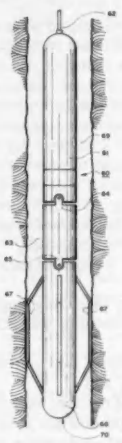
FIG.1b.

4,171,031

WELL LOGGING INSTRUMENT GUIDE APPARATUS

Gerald L. Marquis, London, England, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 3, 1977, Ser. No. 838,681
Int. Cl.[2] G01V *1/40;* E21B *17/10*
U.S. Cl. 181—102 **1 Claim**



1. An apparatus for logging the formations surrounding a highly deviated earth borehole, comprising:

an elongated well logging instrument having first and second ends and adapted to traverse an earth borehole, said first end of said instrument adapted to be connected to a well logging cable and said second end of said instrument having a first flexible U-joint connector;

an elongated centralizer member having first and second ends and having a plurality of arm members adapted to movingly engage the walls of said earth borehole, said first end of said centralizer member having a second flexible U-joint connector with said second end of said centralizer member, being substantially rounded; and

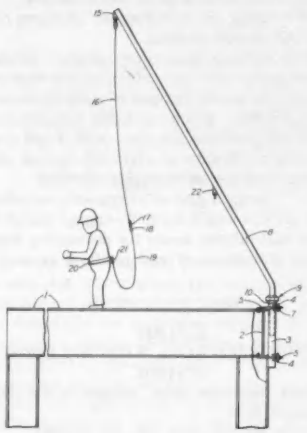
at least one elongated shaft member having opposing ends flexibly connected between said first flexible U-joint connection of said well logging instrument and said second flexible U-joint connection of said centralizer member thereby causing said logging instrument to maintain a decentralized position in relation to said centralizer member within said highly deviated borehole.

4,171,032

SAFETY SUPPORT FOR SAFETY BELTS

Homer J. Woolslayer; Robert D. Woods, and Cecil Jenkins, all of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed Mar. 13, 1978, Ser. No. 886,248
Int. Cl.[2] A62B *35/00*
U.S. Cl. 182—3 **10 Claims**



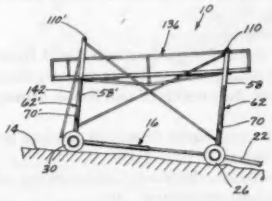
1. A workman's safety support for a safety belt comprising a vertical sleeve, means for securing the sleeve to a side of a structure on which a man works, a pole provided with a lower end portion supported in said sleeve, the pole having a much longer inclined upper portion to provide an upper end directly above a point spaced laterally from the sleeve, the pole being rotatable in the sleeve to permit the upper end of the pole to be swung in an arc around the sleeve, a safety line suspended from said upper end of the pole, and means on the lower end of the line for connecting it to a safety belt, the line being long enough to permit a man wearing the belt to approach close to said sleeve.

4,171,033

SCAFFOLD DEVICE

Willard J. Rust, and Willard M. Rust, both of Spencer, Boyd County, Nebr. 68777

Continuation-in-part of Ser. No. 639,921, Dec. 11, 1975, Pat. No. 4,125,173. This application Aug. 30, 1978, Ser. No. 938,066
Int. Cl.[2] E04G *1/20, 1/24*
U.S. Cl. 182—63 **10 Claims**



1. A scaffold device, comprising,

a wheelded frame means comprising a front axle assembly and a rear axle assembly, said front and rear axle assem-

blies being pivotally connected together about a horizontal axis whereby one of said axle assemblies may be pivoted relative to the other,

a first support having upper and lower ends, said first support being selectively pivotally secured at its lower end to said front axle assembly and extending upwardly therefrom,

a second support having upper and lower ends, said second support being selectively pivotally secured at its lower end to said rear axle assembly and extending upwardly therefrom,

a platform vertically movably mounted on said first and second supports and extending therebetween,

and means for raising and lowering said platform relative to said first and second supports,

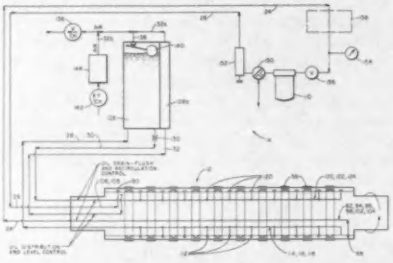
each of first and second supports comprising a tubular means having first and second pairs of oppositely disposed walls, one of said walls in said first pair of walls having a vertical slot formed therein which vertically movably receives a portion of said platform, the other wall of said first pair of walls having a plurality of vertically spaced stops provided thereon on the inside surface thereof,

said platform having a pair of selectively movable means provided thereon which normally engage one of the stops in each of said tubular means for preventing inadvertent downward movement of said platform relative to said supports.

4,171,034
LIQUID LUBRICATED ROLL WITH RECIRCULATION SYSTEM

James O. Gallant, Rehobeth, Mass., assignor to SW (Delaware), Inc., Providence, R.I.

Filed Jan. 27, 1978, Ser. No. 873,081
Int. Cl.[2] F16N *7/32*
U.S. Cl. 184—6.24 **21 Claims**



1. In a liquid lubricated roll having an axle means extending generally horizontally,

a plurality of bearings axially spaced along said axle means, and

a plurality of spools rotatably mounted on said bearings, said spools and said axle means defining therebetween an annular passageway containing said bearings, the improvement comprising,

a liquid reservoir,

first conduit means for guiding said liquid from said reservoir to said passageway to form a rotating annular body of liquid against the interior of said spools during their rotation,

means for directing liquid from said rotating annular body onto said bearings,

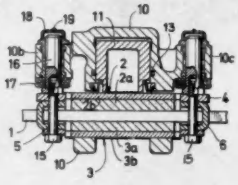
means for controlling the level of said rotating annular liquid body along said passageway, and

means for recirculating said liquid during said rotation along a fluid flow path including said rotating annular liquid body and second conduit means having both of its ends in fluid communication with said annular liquid body.

4,171,035
DISC BRAKE ASSEMBLY AND GUIDE STRUCTURE THEREFOR

Ota Takaaki, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 744,518, Nov. 24, 1976, abandoned, which is a continuation of Ser. No. 586,254, Jun. 12, 1975, abandoned, which is a continuation of Ser. No. 465,472, Apr. 30, 1974, abandoned. This application Aug. 30, 1978, Ser. No. 937,977
Claims priority, application Japan, May 18, 1973, 48-54720
Int. Cl.[2] F16D *55/224*
U.S. Cl. 188—73.3 **2 Claims**



1. A disc brake assembly comprising, in combination: a disc mounted to rotate with an associated wheel;

a pair of brake pads arranged on opposite sides of said disc and adapted to be brought into contact therewith to frictionally brake rotation of said wheel;

a piston adapted to urge one of said brake pads against one side of said disc in response to braking fluid pressure applied thereto:

a cylinder operatively associated with said piston adapted to urge the other of said brake pads against the opposite side of said disc under the influence of a reaction force created in said cylinder between said piston and said cylinder by application therein of said braking fluid pressure;

a torque receiving member mounted to receive braking torque developed in said pads by braking engagement thereof against said disc to prevent relative movement of said pads circumferentially of said disc;

guide means for guiding movement between said piston and said cylinder during application of said braking fluid pressure, said guide means comprising

boss means formed on said cylinder and fixed relative thereto,

pin means extending in sliding engagement within said boss means for effecting guided relative movement therebetween,

means detachably fixing said pin means to said torque receiving member, and

boot means formed of resilient material extending between said boss means and said pin means to form a resilient external seal for said guide means against contaminating materials;

said guide means operating between said cylinder and said torque receiving means to guide movement of said cylinder in directions normal to said disc by the guiding engagement between said pin means and said boss means;

said boss means comprising a generally open-ended cylindrical configuration encircling said pin means with an annular gap being formed between said pin means and said boss means, said boot means comprising a pair of resilient boots each formed at one of said open ends of said boss means, each of said resilient boots including a cylindrical root portion extending into said annular gap with the root portion of one of said boots being in a spaced apart relationship relative to the root portion of the other of said boots to define therebetween within said annular gap an annular clearance forming a reservoir for lubricating material;

means defining on said boss means an inner wall thereof having formed therein annular grooves; and

radial flanges formed on each of said cylindrical root portions of said boots;

said boots being fixed relative to said boss means with said radial flanges engaged within said annular grooves;

said pin means being arranged in axial sliding engagement within said cylindrical root portions of said resilient boots, with lubricating material within said reservoir operating to lubricate said axial sliding engagement between said pin means and said cylindrical root portions.

4,171,036

BRAKE RETRACTOR MECHANISM

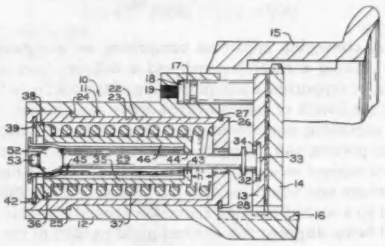
Cornelius L. Plaat, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 747,832, Dec. 6, 1976, abandoned, which is a continuation of Ser. No. 619,523, Oct. 3, 1975, abandoned. This application Jan. 16, 1978, Ser. No. 869,559

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[2] F16D *65/54*

U.S. Cl. 188—196 R **5 Claims**



1. An adjuster assembly for regulating the release clearance between two selectively engageable friction parts to compensate for wear in such parts comprising an expansion member adapted for axial movement in response to actuation and release of said selectively engageable parts, a tubular member of substantially constant diameter throughout its length in frictional and expandable engagement with said expansion member mounted on said assembly for limited axial movement with said expansion member, said tubular member having only a single slit in the wall thereof extending longitudinally the entire length of said tubular member and passing entirely through said wall throughout such length and means for arresting the movement of said tubular member such that said expansion member is adapted for axial and non-cutting movement relative to said tubular member causing the walls of said tubular member to expand whereby the relative axial movement of said expansion member is equal to the wear of such friction parts.

4,171,037

CAR DISC BRAKE IMPROVED IN FRICTION PAD MOUNTING

Teruo Souma, and Masayoshi Katagiri, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 20, 1977, Ser. No. 843,940

Claims priority, application Japan, Jun. 30, 1977, 52-86364[U]

Int. Cl.[2] F16D *65/00*

U.S. Cl. 188—73.5 **2 Claims**

1. In a disc brake including

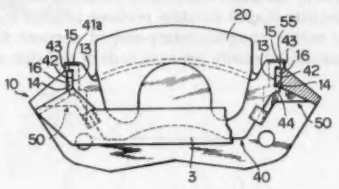
a rotary disc rotatable around the disc axis;

a stationary member located near said rotary disc, and provided with a pair of rod-like guide rails extending in a direction normal to said rotary disc;

a caliper having a pair of depending portions, one of which is provided with a hydraulic cylinder, mounted in such a posture as to straddle the outer periphery of said rotary disc and movable in a direction normal to said rotary disc and further removable from the straddling posture across said rotary disc in a direction parallel to said rotary disc;

a pair of friction pads disposed between said rotary disc and said caliper for being urged onto said rotary disc by said caliper, a backing plate on at least one of said pads, said backing plate being provided with a notch on each lateral end thereof for being fitted thereinto by said guide rails; said disc brake comprising:

(a) a pair of laterally protruding projection portions formed, respectively, on the backing plate on the sides of said notch remote and near from said disc axis, the projection portion formed on the remote side of the notch being



larger than the other said projection portion formed on the near side of the notch; (b) a recess in a pair of said guide rail on said stationary member for permitting said near side projection portion to pass in a direction normal to said guide rail but not permitting said remote said projection portion to proceed nearer to said disc axis than the side surface level of the guide rail remote from said disc axis; and (c) a pair of anti-rattling springs which are respectively provided with an anti-rattling portion, elastically holding said remote side projection portion and said guide rail from opposite sides for preventing the separation of the two from each other, and a setting portion for sandwiching the backing plate from opposite sides, so that said anti-rattling spring may move together with said pad.

4,171,038

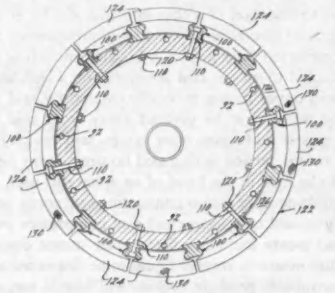
CLUTCH UNIT

Gordon M. Sommer, Grosse Pointe Farms, Mich., assignor to G. M. Sommer Company, Inc., Warren, Mich.

Filed Nov. 9, 1977, Ser. No. 849,857

Int. Cl.[2] F16D *13/68, 25/063, 13/52*

U.S. Cl. 192—70.13 **20 Claims**



1. A clutch unit comprising,

a driving shaft-like member,

a driven shaft-like member,

first and second pluralities of radially disposed alternatively axially arranged clutch discs,

means securing said first plurality of discs for rotation with one of said members and said second plurality of discs for rotation with the other of said members,

pressure operated means operable to cause said first and second pluralities of discs to provide driving connection between said members, and

selective of said discs comprising a plurality of circumferentially arranged individual disc segments,

said first plurality of discs being secured to said driven shaft-like member and said second plurality of discs comprising said disc segments and being drivingly connected to said driving shaft-like member by a plurality of circumferentially spaced axially extending keyway members,

said disc segments extending circumferentially between circumferentially adjacent keyway members and being slidable axially of said keyway members,

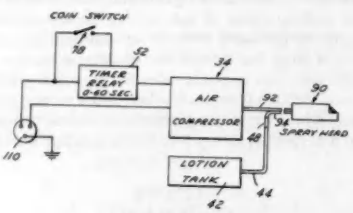
said keyway members comprising circumferentially extending arcuate-shaped shoulder portions adapted for engagement within complementary-shaped portions formed in the circumferentially opposite ends of said disc segments.

4,171,039

COIN OPERATED LOTION DISPENSING APPARATUS

Steve F. Ingham, 2049 Alsup, Union Lake, Mich. 48085

Filed Oct. 14, 1977, Ser. No. 842,272
Int. Cl.² G07F 5/12
U.S. Cl. 194—9 T **7 Claims**



1. Apparatus for selectively dispensing a quantity of liquid such as suntan lotion or the like comprising tank means adapted for storage of a liquid to be dispensed at substantially atmospheric pressure, air compressor means adapted to be electrically powered, means providing a slot in said apparatus adapted to receive a coin, switch means including a first switch responsive to insertion of a coin into said slot by an apparatus user to connect electrical power to said compressor means for only a preselected time period, a housing including mounting means adapted to mount said apparatus on a building wall or the like and cover means pivotally carried by said mounting means and adapted to be pivoted away from said mounting means to expose said compressor means, said switch means and said tank means carried within said housing, spray head means adapted to be held in the hand of an apparatus user, and elongated flexible conduit means connecting said spray head means separately to said tank means and said compressor means, said spray head means including first nozzle means connected by said conduit means to receive liquid to be dispensed at substantially atmospheric pressure and second nozzle means distinct from said first nozzle means connected by said conduit means to receive compressed air from said compressor means, said first and second nozzle means being oriented with respect to each other such that a compressed air stream from said second nozzle means is directed past said first nozzle means externally of said spray head means to both aspirate liquid from said tank means through said first nozzle means and atomize liquid aspirated from said first nozzle means to form a high-velocity liquid spray mist.

4,171,040

SIDE MOVER WHEEL FOR GRAIN AUGER

Geoffrey P. Nickol, P.O. Box 1060, Coaldale, Alberta, Canada (T0K 0L0)

Filed May 20, 1977, Ser. No. 799,129
Claims priority, application Canada, May 21, 1976, 253127
Int. Cl.² B65G 41/00
U.S. Cl. 198—302 **13 Claims**

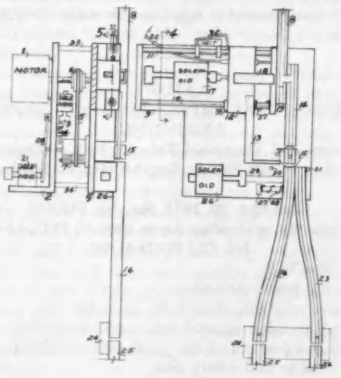
1. A conveying apparatus comprising an elongated conveyor having a receiving end and a delivery end, support means for supporting a central portion of the conveyor located along the length of said conveyor above the ground, a vertically adjustable, non-driven wheel located directly below said central portion, and a hand-operated lowering device mounted on said support means for lowering said wheel to a first position where said wheel engages the ground and for lifting said wheel to a second position above the ground, the axis of said wheel being disposed in a vertical plane parallel to the length of said conveyor wherein, when said wheel is in said first position, the weight of said conveyor borne by said support means is substantially supported by said wheel and the horizontal position of said delivery end relative to the receiving end can be varied by means of said wheel by applying a horizontal force to said support means in a direction perpendicular to the length of said conveyor.

4,171,041

CONVEYOR SYSTEM WITH OBJECT ROTATOR

James A. Lowe, P.O. Box 22542, Honolulu, Hi. 96822

Continuation-in-part of Ser. No. 743,608, Nov. 22, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,433
Int. Cl.² B65G 47/24
U.S. Cl. 198—379 **2 Claims**



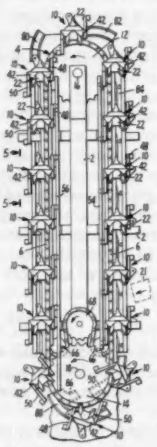
1. In an object conveying and rotating apparatus comprising: a rotor assembly means having a C-shaped conveying track,

wherein the object to be conveyed and rotated is received within the walls of the track forming the C-shaped cross section, the ends of the C-shaped cross-section having inwardly directed flanges which extend the length of the track, the track being mounted on a rotatable support means such that the opening in the C-shaped track formed by the flanges is opening away from the rotatable support, reciprocable lock bar which passes through the rotatable support and the portion of the track that is opposite the opening formed by the flanges, means to urge the lock bar into contact with the object that is received within the track and to urge the object against the flanges of the track thereby restraining the object from any movement relative to the track, means for selectively rotating the rotatable support to thereby rotate said track and said object, and means to retract the lock bar when the rotating means is stopped.

4,171,042
FRUIT POSITIONING APPARATUS

Konrad E. Meissner, Lafayette, Calif., assignor to California Processing Machinery, San Ramon, Calif.

Filed Nov. 7, 1977, Ser. No. 849,261
Int. Cl.[2] B65G *47/24, 47/40*
U.S. Cl. 198—386 **6 Claims**



1. Apparatus for positioning fruit of the drupe type, comprising

a support frame,

conveying means mounted on said support frame and traveling in a continuous, vertically elongated path, traveling continuously up one portion of said path and then down the opposite portion,

a plurality of fruit holding cups mounted upon and spaced along said conveying means for receiving fruit from a receiving station during the upward portion of their travel and carrying said fruit to a discharge station located on the downward travel portion of said conveying path, whereby the fruit received by the cups is carried up the one portion of the path, over the top and then down the other portion to the discharge station for removal,

means for maintaining each said fruit holding cup facing upwardly during the entire portion of its travel from said receiving station to said discharge station,

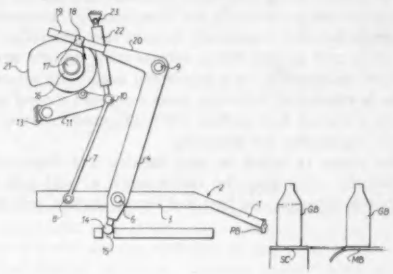
means operatively connected to each said fruit holding cup for orienting said fruit in a predetermined direction with respect to said cup, said orienting means being operative to urge said fruit to said orientation during both said upward portion and said downward portion of travel of said fruit from said receiving station of said discharge station, and

means for inverting each said fruit holding cup during a portion of its travel from said discharge station to said receiving station, whereby undesired matter remaining in said fruit holding cap after removal of the fruit at the discharge station may be dumped by such inversion.

4,171,043
TRANSFER MECHANISM

John P. Doyle, Macclesfield, England, assignor to Sheppee Engineering Limited, York, England

Filed Jul. 18, 1977, Ser. No. 816,343
Claims priority, application United Kingdom, Jul. 29, 1976, 31551/76
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—430 **15 Claims**



1. A pusher bar transfer mechanism for transferring a line of articles by employing a substantially horizontal movement of the pusher bar to effect the transfer by pushing the articles from one side of the line thereof, said transfer mechanism comprising, in combination, a pusher bar, swingable support means connected to said pusher bar for supporting the same and extending upwardly therefrom to mounting means from which said support means is suspended, said support means being of a type which permits said pusher bar to swing freely in a substantially horizontal plane in and compoundedly between mutually perpendicular directions relative to said mounting means, drive means for swinging said pusher bar relative to said mounting means to effect a transfer operation, guide means including means effecting a specific path of movement of said pusher bar having a first component of motion parallel to said line of articles and a second component of motion transverse to said line of articles, said support means causing said pusher bar to be maintained against said articles during a transfer operation without substantially changing its position relative thereto, said drive means effecting oscillation of said support means thereby producing a return movement of said pusher bar, the support means being in the form of a suspension including depending arms having lower ends, each arm being mounted so that the arm can swing freely about its mountings with the mounting means and the pusher bar, and said guide means being in the form of a cam track in which the lower end of one of said arms engages and which thereby determines the specific path of movement of the pusher bar.

4,171,044
INCLINED BELT CONVEYOR

John H. Rossio, Kalamazoo, Mich., assignor to LaRos Equipment Company, Inc., Portage, Mich.

Continuation-in-part of Ser. No. 666,343, Mar. 12, 1976, Pat. No. 4,050,575. This application Sep. 23, 1977, Ser. No. 835,873
The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.
Int. Cl.[2] B65G *23/06*
U.S. Cl. 198—834 **8 Claims**

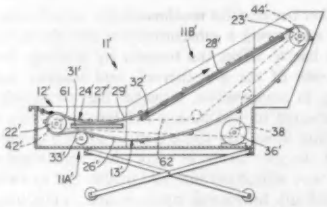
1. In a belt conveyor having a housing, first and second elongated rollers supported on said housing for rotation about

substantially parallel horizontal axes, an endless flat belt supported on and extending between said rollers, said belt being of substantial width and having an outer surface adapted to support articles thereon as they are being moved by said conveyor, and a drive device interconnected to one of said rollers for moving said belt, comprising the improvement wherein:

said second roller is displaced horizontally from and vertically above said first roller;

said belt having a non-straight upper reach which extends between said first and second rollers, said upper reach including first and second elongated belt portions which extend at a substantial angle with respect to one another, said first belt portion being positioned adjacent said first roller and extending outwardly therefrom in a direction which is generally toward said second roller, said second belt portion being positioned adjacent said second roller and extending outwardly and downwardly therefrom in a direction which is generally toward said first roller, said second belt portion being substantially straight and inclined downwardly at a substantial angle with respect to the horizontal as it extends away from said second roller, and a curved belt portion interconnected between said first and second belt portions;

guide means mounted on said housing and disposed for guidably supporting the upper reach of said belt as it extends between said first and second rollers, said guide



means engaging the undersurface of said upper reach so that as it extends between said first and second rollers it is supported solely by the guidable engagement of the undersurface thereof with said guide means;

said drive device causing simultaneous rotation of said first and second rollers in the same rotational direction for causing movement of the upper reach of said belt in a direction from said first roller toward said second roller so that articles supported on said upper reach are moved upwardly by said second belt portion; and

said drive device including a common drive motor, a power train drivingly connected between said motor and said second roller for causing rotation thereof at a selected peripheral speed, and said power train being drivingly connected between said motor and said first roller for causing rotation thereof at a peripheral speed which is at least equal to said selected peripheral speed, said power train comprising a positive drive-type endless driving member means extending between and drivingly connected to said motor and both of said first and second rollers, whereby the upper belt reach is substantially free of tension and is maintained in a desired non-straight configuration due to said upper reach being supported solely by said first and second rollers and said guide means so that said upper belt reach does not require the use of any guiding structure disposed in engagement with the upper surface thereof.

4,171,045

RAISED LINK MODULAR CONVEYOR BELT

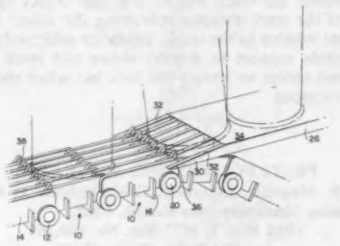
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jan. 20, 1978, Ser. No. 870,995

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.[2] **B65G** *17/06*

U.S. Cl. 198—853 **15 Claims**



1. A linked belt adapted to move through a circular arc for use in conjunction with a conveyor comb having a plurality of spaced-apart parallel teeth, said belt comprising:

a plurality of like modules, each of said modules including first and second pluralities of link ends, each end being formed to circumscribe a pivotal hole;

means for joining said pluralities to one another so that the axes of said holes of said first plurality are arranged coaxially, the axes of said holes of said second plurality are arranged coaxially and the axes of respective holes of both pluralities of link ends are substantially parallel;

a plurality of spaced apart elongated upstanding vanes mounted on said modules so as to extend in a substantially parallel direction to one another in a direction transverse to the axes of said holes of said both pluralities and protrude substantially perpendicularly from said module;

the upper surface of said vanes defining a conveying surface of said belt;

said link ends of each of said modules being releasably engaged between the link ends of an adjacent module except for individual link ends disposed at the extreme sides of said belt;

means for pivotally connecting said modules at engaged link ends;

said elongated vanes of each of said modules being arranged in staggered relation with respect to the vanes of adjacent modules, said vanes of each module being spaced from one another sufficiently to form a multiplicity of channels lying beneath the uppermost surface of said belt, said channels being adapted to receive said teeth; and

a plurality of dogs mounted on each of said modules, each dog upstanding from the upper surface of a respective one of said vanes and disposed along a transverse axis to said vanes, and operative to push an article carried on the conveying surface of the belt onto the conveyor comb as the belt moves downward in a circular arc.

4,171,046

MULTI-CELLED CONTAINER CARRIER

Bruno C. Bonczyk, East Alton, Ill., assignor to Alton Box Board Company, Alton, Ill.

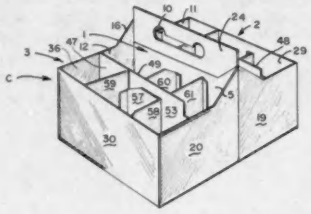
Filed Feb. 13, 1978, Ser. No. 877,277

Int. Cl.[2] **B65D** *73/00*

U.S. Cl. 206—193 **20 Claims**

1. A multi-celled container carrier for use in the conveyance of a plurality of articles, comprising, a central panel providing a division between compartments disposed to either of its sides and furnishing cells for holding a plurality of articles, there being a hand-gripping means disposed upwardly of the central

panel to facilitate its conveyance, said central panel being formed from a pair of panels, with said pair of panels being pivotally connected along their upper edges, said gripping means comprising aligned slots being formed through the upper portion of each of the pair of panels and below their pivotally connected upward edges, a first end wall connecting to one side edge of each of the pair of panels forming the central panel, opposite end walls connecting to the other side edge of each of the pair of panels of the central panel, side walls connecting to the other side edges of each of the opposite end walls, connecting flaps provided at the other edges of the said side walls, said connecting flaps securing with their proxi-



mate first end walls, a bottom wall connecting with the lower edge of each side wall, with the inner edge of each bottom wall being secured proximate the lower edges of the said pair of panels forming the central panel, the said bottom walls, end walls, and the side walls forming the said compartments to either side of the formed central panel, divider means provided at each side of the central panel within the said compartments, each divider means arranging at least a pair of rows of cells at either side of the said central panel for holding and conveying of the said plurality of articles during carrier usage, and said pairs of rows of cells provided to either side of the central panel and within the formed compartments being arranged in parallel with respect to said central panel.

4,171,047

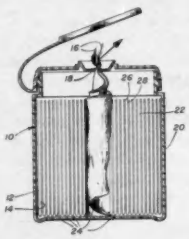
PACKAGE INCLUDING A CONTAINER AND A LONGITUDINALLY FOLDED PRE-MOISTENED WEB THEREIN

Ross L. Doyle, Ramsey, N.J., and Thomas S. Harrison, Deer Isle, Me., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 619,390, Oct. 3, 1975, abandoned. This application Sep. 29, 1977, Ser. No. 837,884

Int. Cl.[2] B65D *81/22, 85/671*

U.S. Cl. 206—210 **12 Claims**



1. A package comprising a container, a plurality of sheets of wickable material therein, said sheets being generally vertical with edges thereof adjacent the bottom of the container, and liquid in the container at the bottom thereof in contact with said edges,

the sheets when non-folded having a height greater than the wickability of the sheets with respect to the type of liquid in the container,

said sheets being folded so that their heights are less than when in non-folded condition, the nature and quantity of the liquid within the container and the wickability of the sheets being such that wickability will be provided across the entire height of the folded sheets as long as liquid remains in the container in contact with the lower edges of said folded sheets.

4,171,048

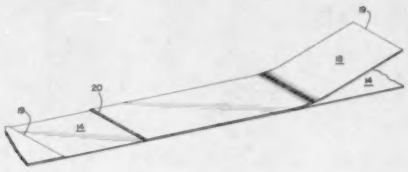
PLASTIC BAG CONSTRUCTION IN SERIAL ROLL FORM

Edwin F. Ernst, 3722 Buckingham Dr., Roanoke, Va. 24018

Filed Oct. 12, 1977, Ser. No. 841,441

Int. Cl.[2] B65D *31/10*

U.S. Cl. 206—390 **15 Claims**



1. An article of manufacture comprising:

means for providing a roll package containing a plurality of expandable bag structures connected in serial manner, each individual bag structure having gusset means at one end thereof to permit expansion thereof when said bag structure is put into use, each individual bag structure also having an opening means at the other end thereof, both the said gusset means and the said opening means being traverse to the length of the plurality of serially connected bag structures, and the gusset means of each individual bag structure being near the opening means of the next individual bag structure, each gusset means being of at least a three panel traverse fold with the side edges sealed together along the side edges of said roll.

4,171,049

MAGAZINE AND A METHOD OF STORING ELECTRONIC COMPONENTS

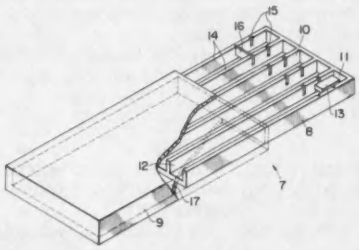
Yasumoto Nohara, Hamura; Yukio Harada, Hachiouji; Morio Toyooka, Musashimurayama, and Takashi Harada, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 27, 1976, Ser. No. 736,096

Claims priority, application Japan, Oct. 29, 1975, 50-129212

Int. Cl.[2] H05F *3/02;* **B65D** *85/30*

U.S. Cl. 206—328 **14 Claims**



1. A magazine for storing electrical components comprising a magazine body and a cover, said magazine body being formed of electrically-conductive resin and having a plurality of upstanding partition walls defining a plurality of receiving grooves which are upwardly open along substantially their entire length and provided in parallel with one another on an open upper side thereof, said grooves being open at one end

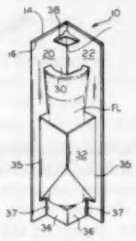
thereof so as to provide an unobstructed opening through which said electronic components can be inserted and the other end of said grooves being closed by an end wall to prevent movement of an electrical component received in a groove from passing out said other end, said cover being formed with wall means overlying said open end of said grooves and said upper side of said body.

4,171,050

PACKAGING STRUCTURE

Lowell C. Murray; Michael L. Weisheit, both of Fort Wayne, Ind., and Louis C. Michetti, Santa Clara, Calif., assignors to Container Corporation of America, Chicago, Ill.

Filed May 1, 1978, Ser. No. 901,684
Int. Cl.[2] B65D *73/00*
U.S. Cl. 206—463 **1 Claim**



1. A package for displaying an article, said package being formed from a blank of paperboard or the like and comprising:
(a) front and rear generally rectangular co-extensive panels disposed in contacting overlying relationship and having opposed marginal portions secured to each other;
(b) a pair of aligned openings in said panels for receiving a portion of said article;
(c) said panels presenting abutment means for engaging opposite ends of said article to prevent axial movement of said article relative to said panels;
(d) said panels each having side portions folded upwardly from the normal plane of said panels at an angle of less than 90 degrees to provide a trough-like structure therebetween for cradling said article;
(e) an article holding member formed from material of said front panel and defined by a pair of spaced cut lines extending generally transversely of said panel;
(f) said article holding member being spaced from the remainder of said front panel and extending over said article to retain said portion of said article in said openings;
(g) a transverse strut formed in said rear panel and positioned in the plane thereof;
(h) said strut bridging said pair of openings in said rear panel to prevent dislodgement of the article through said rear panel.

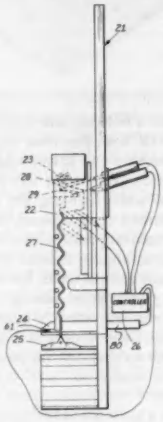
4,171,051

APPARATUS FOR SERIALLY TRANSPORTING, TESTING AND ORIENTING CYLINDRICAL COMPONENTS

Robert W. Wullenwaber, 1141 St. Regis Pl., Santa Ana, Calif. 92705

Filed Jan. 4, 1977, Ser. No. 756,638
Int. Cl.[2] B07C *5/08*
U.S. Cl. 209—542 **4 Claims**

1. An apparatus for producing a serial progression of cylindrical components, testing the components, orienting the components to either of two anti-parallel orientations and rejecting out of tolerance components comprising:
(a) a feeder-serializer assembly for receiving bulk cylindrical components and producing a single file progression of components therefrom,
(b) a first conveyor track for transporting single-file progressions of cylindrical components from the feeder-serializer assembly to a test head assembly,
(c) a test head assembly for selecting and grasping a single component confined within the first conveyor track, isolating the selected component, testing the component and releasing the tested component to permit resumption of its motion within the first conveyor track,
(d) an orienter assembly for rotating a selected component of one polarity ninety degrees clockwise about a vertical axis perpendicular to the cylindrical axis of the component, rotating a component of the opposite polarity ninety degrees counterclockwise about a vertical axis perpendicular to the cylindrical axis of the component, and imparting a lateral displacement to out-of-tolerance components,
(e) a second conveyor track for transporting single file progressions of cylindrical components rotated about a vertical axis ninety degrees with respect to the components entering the orienter assembly,
(f) at least one sensor to determine the quantity and location of components in the feeder-serializer assembly,
(g) at least one sensor to determine the presence of a component in the test head assembly,
(h) at least one device to measure component parameter values and polarities and,
(i) a controller having means for storing measured component parameter values and polarities, comparing the values and polarities with predetermined values and polarities, actuating the orienter assembly to impart a ninety degree clockwise rotation to components having one measured polarity, a ninety-degree counterclockwise rotation to components having an opposite measured polarity a lateral displacement to out-of-tolerance components, responsive to feeder-serializer sensor signals to control operation of the feeder-serializer assembly, and responsive to test head assembly sensor signals to control operation of the test head assembly.



4,171,052

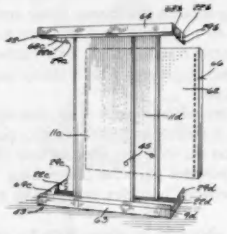
MERCHANDISE DISPLAY UNIT

Ronald R. Winn, Galesville, Wis., assignor to Ernest Kempler, Chicago, Ill., a part interest

Filed Sep. 7, 1976, Ser. No. 720,922
Int. Cl.[2] A47F *5/00*; A47B *57/16*
U.S. Cl. 211—162 **22 Claims**

1. A display unit comprising a headboard; a footboard; at least two vertically disposed standards, with multiple regularly spaced openings, to which the headboard and footboard are

attached by keys; at least one display panel with a top edge, a bottom edge and a forward face, which panel is slideably mounted to travel sideways within the confines of the headboard and footboard with its forward face always lying in a transverse vertical plane; panel top guide means for each display panel which mount separately in said headboard; and panel bottom guide and support means for each display panel which mount separately in said footboard; the improvement



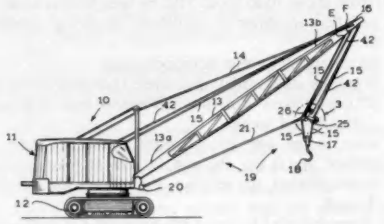
comprising means to slideably adjust individual panel top guide means and associated panel bottom guide and support means in a direction normal to the forward face of the display panel associated with said panel top guide means and said panel bottom guide and support means, whereby said display panel can be positioned with its forward face in any transverse vertical plane lying within its limits of travel, defined by the confines of the headboard and footboard.

4,171,053

ANTIPENDULATION CRANE

Robert F. Cecce, Rte. 1, Box 177E5, Kearneysville, W. Va. 25430

Filed Aug. 24, 1977, Ser. No. 827,327
Int. Cl.[2] B66C *23/08*
U.S. Cl. 212—58 A **13 Claims**



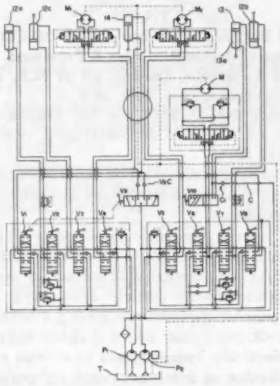
1. Crane apparatus comprising: a boom assembly having inner and outer end portions and a topping or luffing plane; a hoist line extending from the outer end portion of said boom assembly; antipendulation means for maintaining at least a portion of said hoist line substantially within the topping or luffing plane of said boom assembly when said crane apparatus is tipped in a non-horizontal position and when said crane apparatus is in a horizontal position, said antipendulation means comprising guide means with a path of movement along said hoist line for guiding said hoist line and means associated with said guide means for exerting sideward forces against said guide means for maintaining said guide means substantially within the topping or luffing plane of said boom assembly, said sideward force exerting means comprising laterally extending rigid means located in the vicinity of the inner end portion of said boom assembly for extending lines, said laterally extending rigid means having respective portions located away from the respective sides of said boom assembly, and lines extending from the respective portions of said laterally extending rigid means toward said guide means, means associated with said lines extending toward said guide means for letting out or drawing in either simultaneously or individually on said lines extending toward said guide means and means associated with said guide means for moving said guide means in a generally upwardly or downwardly or vertical direction along the path of said hoist line.

4,171,054

WORK VEHICLE WITH HYDRAULIC CIRCUIT FOR SWIVEL MOTOR AND WORK ASSEMBLY ARM MOTOR

Ryoichi Tanaka, Neyagawa, and Tadao Adachi, Sakai, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Dec. 22, 1977, Ser. No. 863,296
Claims priority, application Japan, Dec. 28, 1976, 51-158099; Sep. 30, 1977, 52-132325[U]; Oct. 7, 1977, 52-135315[U]
Int. Cl.[2] E02F *3/00, 3/32;* B66F *9/22*
U.S. Cl. 414—687 **9 Claims**



1. A work vehicle having a swivel platform (3) mounted on a chassis (2), a work arm assembly (A) mounted for horizontal oscillation on the swivel platform (3), and a hydraulic circuit enabling the swivel platform (3) and the work arm assembly (A) to be actuated by means of separate hydraulic actuators (M), (13) said hydraulic circuit comprising;

a control valve (V_6) connected to said actuators (M), (13) in parallel, and

a passage selection valve (V_{10}) interposed between said control valve (V_6) and said actuators (M), (13),

the swivel platform (3) and the arm assembly (A) being movable in the same direction as the control valve (V_6) is operated in one direction.

4,171,055

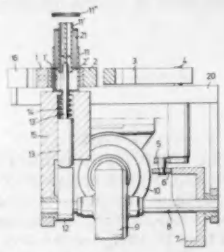
FILM CASSETTE OPENER

Bertil Lindgren, Storgatan 37 E, 152 00 Strängnäs, Sweden

Filed Sep. 23, 1977, Ser. No. 836,210
Claims priority, application Sweden, Oct. 5, 1976, 7611004
Int. Cl.[2] B65G *65/04;* B65D *49/12*
U.S. Cl. 414—412 **7 Claims**

1. A film cassette opener, characterized in that it comprises a pair of mutually movable jaws (1, 2) with contact surfaces, which preferably are provided with saw teeth or jags (1', 2') for reliably retaining a film cassette (11) positioned between the jaws and containing a film (21) rolled on a spool (11'), and an axially reciprocating ejector bar (13'), which by means of a mechanic drive means is displaceable axially relative to the

retained film cassette and capable with one end to thrust against the spool with film, so that the spool first pushes off the



outer end wall cover (11") of the film cassette and thereafter together with the film is pressed out of the film cassette.

4,171,056

COATED BOTTLE AND METHOD OF COATING

Martin J. Hannon, Martinsville; Alex S. Forschirm, Parsippany, and Richard K. Greene, Summit, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,820

Int. Cl.[2] **B65D** *11/16;* **B05D** *3/02, 1/36*

U.S. Cl. 215—12 R **42 Claims**

1. A glass container coated on its outer surface to prevent the scattering of glass fragments which comprises

(A) a glass container,

(B) an inner smooth non-particulate coating initially applied to (A) as non-tacky composite powder particles intimately contacted on the external wall surface of said container said composite powder particles comprising

(a) tacky powder particles comprising a mixture of

(1) a block copolymer which is either unhydrogenated or selectively hydrogenated to at least some degree and having at least two kinds of polymer blocks wherein one polymer block is designated by A and a second polymer block is designated by B such that prior to hydrogenation,

(a) each A is a polymer end block of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said blocks A comprising from about 5 to about 50% by weight of the total block copolymer, and

(b) each B is a polymer mid block having a number average molecular weight of from about 30,000 to about 300,000, and formed from a conjugated diene selected from homopolymers of at least one conjugated diene having 4 to 10 carbon atoms per molecule, said blocks B comprising from about 50 to about 95% by weight of the total block copolymer,

(2) at least one melt flow modifier selected from the group consisting of

(a) monovinyl arene homopolymers,

(b) alpha alkyl monovinyl arene homopolymers, and

(c) copolymers of monovinyl arenes and alpha alkyl monovinyl arenes, wherein the aromatic portions of the polymers described (2) (a), (b) and (c) are at least partially hydrogenated to remove the aromatic character thereof, and

(3) at least one adhesion promoter, and

(b) smaller solid particles, which are hard and non-tacky and which comprise at least one melt flow modifier of the group described in (a) (2) with the provision that the melt flow modifier have a glass transition temperature of at least about 20° C., adhering to the tacky surface of said tacky particles of (a) in a non-continuous layer, said composite powder particles being rendered in the configuration of a smooth non-particulate inner coating of the external surface of the glass container by heat and,

(c) an outer top coat of a synthetic resin covering substantially the entire outer surface of said inner coat and a part of the external glass container surface and selected from the group consisting of epoxy resins, polyurethanes, polycarbonates, polyesters, polystyrenes, ethylene/vinyl acetate copolymers and acrylic homopolymers and copolymers wherein the outer film has high abrasion resistance, wet and dry scratch resistance, water resistance, chemical resistance, oil resistance, and weather resistance.

21. A glass bottle coated on its outer surface to prevent the scattering of glass fragments which comprises

(A) a glass bottle

(B) an inner smooth non-particulate coating initially applied to (A) as non-tacky composite powder particles intimately contacted on the external wall surface of said bottle, said composite powder particles comprising

(a) tacky powder particles comprising a melt blend mixture of

(1) from about 25 to about 90% by weight of a block copolymer which is either unhydrogenated to at least about 10% and having at least two kinds of polymer blocks wherein one block is designated by A and a second polymer block is designated by B such that prior to hydrogenation,

(a) each A is a polymer end block of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said blocks A comprising from about 10 to about 40% by weight of the total block copolymer, and

(b) each B is a polymer mid block having a number average molecular weight of from about 30,000 to about 300,000, and formed from a conjugated diene selected from homopolymers of at least one conjugated diene having 4 to 10 carbon atoms per molecule, said blocks B comprising from about 60 to about 90% by weight of the total block copolymer,

(2) from about 10 to about 75% by weight of at least one melt flow modifier selected from the group consisting of

(a) monovinyl arene homopolymers,

(b) alpha alkyl monovinyl arene homopolymers, and

(c) copolymers of monovinyl arenes and alpha alkyl monovinyl arenes

wherein the aromatic portions of the polymers described in (2) (a), (b) and (c) are at least partially hydrogenated to remove the aromatic character thereof,

(3) from about 0.1 to about 8% by weight of at least one adhesion promoter, and

(4) less than about 10% by weight of at least one member of the group consisting of stabilizers against oxidation and stabilizers against ultraviolet light, and

(b) smaller solid particles, which are hard and non-tacky and which comprise at least one melt flow modifier of the group described in (a) (2) with the provision that the melt flow modifier have a glass transition temperature of at least about 20° C., adhering to the tacky surface of said tacky particles of (a) in a non-continuous layer, said composite powder particles being rendered in the configuration of a smooth non-particulate inner coating of the external surface of the glass container by heat and

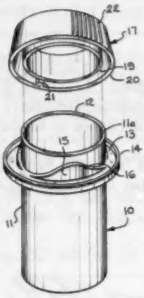
(C) an outer top coat of a synthetic resin covering substantially the entire outer surface of said inner coat and a part of the external glass bottle surface and selected from the group consisting of epoxy resins, polyurethanes, polycarbonates, polyesters, polystyrenes, ethylene/vinyl acetate copolymers and acrylic homopolymers and copolymers wherein the outer film has high abrasion resistance, wet and dry scratch resistance, water resistance, chemical resistance, oil resistance, and weather resistance.

4,171,057

CHILD-RESISTANT MEDICINE VIAL

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 30, 1978, Ser. No. 956,107
Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—211 **5 Claims**



1. A combination child-resistant container and cap therefor, consisting of:

(a) a container having,

(1) an open topped body which has an open annular neck terminating in an annular lip that lies in a radial plane of the neck,

(2) a thin planar, annular flange extending outwardly from the outer side of said body the upper surface thereof being spaced axially below said lip, and

(3) at least one arcuate ramp on said flange, said ramp having a radial thickness less than the width of said flange and said ramp having an upwardly extending top surface rising at at least one end from the upper surface of said flange, and,

(b) a cap for said container, said cap having

(1) a disc-like top,

(2) a resilient inner, tubular skirt depending from said top and adapted to tightly fit into the interior of said container neck,

(3) an outer, annular skirt depending from said top which is adapted to telescope over said container neck and which has,

(a) an axial length such as to extend downwardly into close proximity to said container flange,

(b) an outer diameter at its bottom edge no greater than the outer diameter of said flange,

(c) an inner diameter greater than the outer diameter of said ramp, and,

(4) at least one lug on the inner side of said outer skirt, said lug having a radial thickness less than the space between the outer side of said ramp and the inner side of said outer skirt,

---

4,171,058

KNOCK-DOWN SLOT-LOCK CONTAINER

Edward H. Collins, Medford, Oreg., assignor to The Mt. Pitt Company, Medford, Oreg.

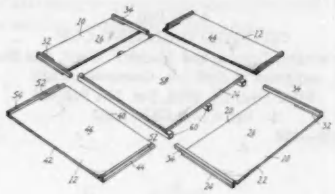
Filed Jan. 3, 1978, Ser. No. 866,505
Int. Cl.[2] B65D *9/12, 9/34, 7/24*
U.S. Cl. 217—12 R **1 Claim**

1. A knock-down container comprising

first and second pairs of panels, each panel having front and back surfaces, upper and lower edges, and a central section bounded by opposed side end regions,

slot means adjacent said panel end regions for interlocking panels of said first pair with panels of said second pair to form an interlocked, noncollapsible structure in which said front surface of each panel faces inwardly, and said opposed, side end regions of each panel extend beyond said back surfaces of panels interlocked therewith, with said upper edges of said panels forming said structure being substantially coplanar, said slot means comprising, for each panel of said first pair of panels, a pair of vertical slots which extend adjacent an upper portion of said side end regions, and open to said upper edge, and, for each panel of said second pair of panels, a pair of vertical slots which extend adjacent a lower portion of said side end regions, and open to said lower edge,

cleats attached to said front surfaces of said side end regions of each panel, positioned thereon to abut the back surfaces of opposed panels interlocked therewith to brace said



opposed panels against a force directed against the front surface thereof, said cleats on said first pair of panels being substantially vertically coextensive with outwardly facing surfaces of adjacent interlocked panels of said second pair,

a bottom member, and

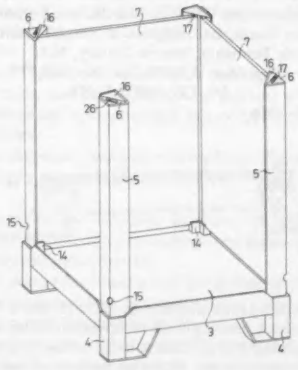
mounting means for mounting said structure on said bottom member, said mounting means including a plurality of skids extending outwardly from two opposite sides of said bottom member, said skids being dimensioned to support the lower edges of one of said pairs of panels with the lower edges of the other pair of panels and the cleats of the one pair of panels extending downwardly to the base of said skids.

4,171,059

STACKABLE LOADING PLATFORM

Karl H. Heller, Gehrden, and Dieter Schiron, Hanover, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 5, 1978, Ser. No. 921,943
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730445
Int. Cl.[2] B65D *7/00;* **B65J** *1/02;* **B65D** *9/34*
U.S. Cl. 220—4 F **3 Claims**



1. A stackable loading platform having a bottom with a plurality of hollow feet, a plurality of supports respectively located at said feet and detachably arranged therein, and a plurality of side walls arranged between and detachably engag-

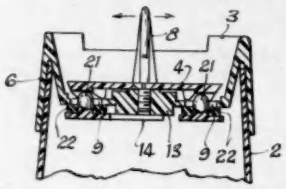
ing the respective adjacent supports, said side walls in the corner regions of their upper edges being positively connected to said supports, said supports being selectively movable in the longitudinal direction thereof away from said bottom for removing said supports from said platform, characterized in that rigid stops are associated with said platform in the region of said feet for securing the lower edges of said side walls against inward movements, said stops comprising metal strips respectively firmly inserted into the pertaining feet, said strips extending approximately diagonally across the opening of said feet, at least the middle portion of said strips being raised higher than the level of said platform.

4,171,060

COVERED DRINKING CUP

James S. Howard, Corona, and Joseph F. Ortiz, San Diego, both of Calif., assignors to Spil-Les, Oceanside, Calif.

Filed Dec. 11, 1978, Ser. No. 968,464
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—254 **5 Claims**



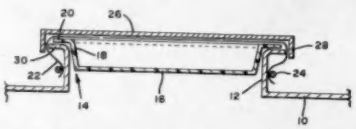
1. A vessel for drinking or for holding and pouring powdered and liquid substances which comprises:
   - a cup-shaped receptacle;
   - a detachable lid covering the receptacle having a depressed top area and at least one orifice within the depressed top area;
   - a shutter matching said orifice;
   - means for resiliently holding the shutter against said orifice; and,
   - means rotating within a plane perpendicular to the central axis of said receptacle and lid for pushing the shutter away from said orifice in a direction substantially orthogonal to the plane of said orifice.

4,171,061

CONTAMINATION-PREVENTING CLOSURE

Harold R. Burroughs; Willie E. Martin, and Vernon J. Jordan, all of Baton Rouge, La., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 6, 1978, Ser. No. 883,777
Int. Cl.[2] B65D *51/18*
U.S. Cl. 220—256 **8 Claims**



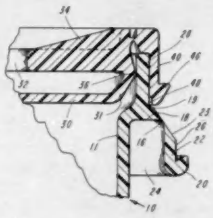
1. A contamination-preventing closure for a hopper car which includes a housing with an upwardly extending loading member defining therewithin a large cross-sectioned loading aperture communicating with the interior of the hopper car and also includes a hatch cover fittable over the loading member in a closed position covering said loading aperture;
   - said contamination-containing closure comprising a rigid member with a horizontally extending first portion occupying a major portion of the cross-sectional area within the loading aperture, a second portion extending upwardly from the first portion inwardly adjacent of the interior of the loading member and a third portion extending outwardly from said second portion and overlaying the top of the loading member and underlaying the hatch cover when the hatch cover is in its closed position, and a flexible plastic member overlaying said rigid member and the loading member and underlaying the hatch cover when the hatch cover is in its closed position.

4,171,062

CONTAINER HAVING CLOSURE FASTENING MEANS

David O. Allen, Wilmington, and Harry A. E. Wombold, Dayton, both of Ohio, assignors to Buckeye Molding Company, New Vienna, Ohio

Filed Feb. 16, 1978, Ser. No. 878,607
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 **13 Claims**



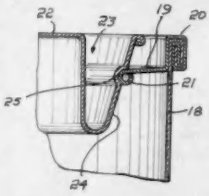
1. In a molded plastic container, improved means for securing a closure to said container, comprising:
   - a circumferentially extending, reversible member integrally molded to the outer surface of said container and pivotal relative to said outer surface from a first position wherein said closure when in normal position on said container would not be engaged by said reversible member to a second, reversed position wherein said reversible member would engage said closure when in normal position on said container, said reversible member extending completely around said container.

4,171,063

CONTAINERS FOR PAINTS AND OTHER COATING MATERIALS

John G. Cloutier, 54 Common St., Saco, Me. 04072

Filed May 30, 1978, Ser. No. 910,372
Int. Cl.[2] B65D *39/00*
U.S. Cl. 220—307 **4 Claims**



1. A can and a cover therefor, said can including an internal, mouth-defining flange spaced below the rim of the can and disposed to prevent the accumulation of liquid thereon between the wall of the can and the inner margin of the flange, said cover including an upwardly opening marginal channel of a depth greater than the distance between said margin and the rim of the can, the bottom of said channel spaced inwardly of

said margin and the outer wall of said channel inclined upwardly towards said rim resiliently yieldable, an intermediate portion of said outer channel wall including a portion dimensioned to frictionally engage and become mechanically but releasably interlocked to said flange margin whenever the cover has been seated in said mouth to bring the plane of the cover into a predetermined position such that it does not protrude above a plane inclusive of the rim of the can.

4,171,064

CARDBOARD BLANK FOR GAS-TIGHT AND LIQUID-TIGHT FOLDING BOXES

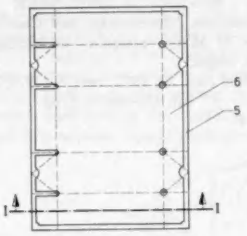
Hans Friess, Linnich; Fritz Kettenbach, Hückelhoven; Jürgen Färber, Kaarst; Karl T. Witter, Linnich, and Ulrich Ströle, Titz, all of Fed. Rep. of Germany, assignors to Papier- und Kunststoff-Werke Linnich G.m.b.H., Dusseldorf, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,299

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703533

Int. Cl.[2] B65D *5/56*

U.S. Cl. 220—418 **8 Claims**



1. In a cardboard blank for a gas-tight and liquid-tight folding box, especially one printed externally, carrying on the cardboard surface which is to be the inside of the box a full-surface layer of heat-sealable plastic, the improvement which comprises an additional plastic layer positioned between the full-surface plastic layer and the cardboard, the additional layer being provided only over portions of the surface including the seam areas, the thickness of the full-surface plastic layer together with the local additional plastic layer being sufficient for tight, hot-sealed seams.

4,171,065

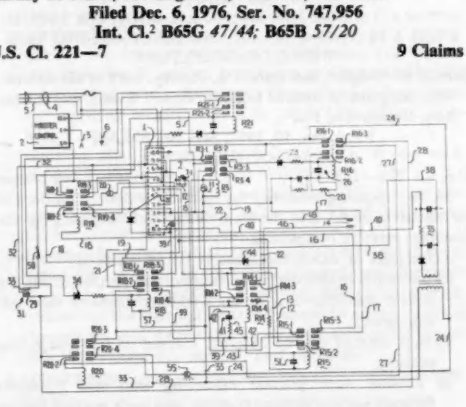
CIRCUITRY AND SYSTEM FOR CONTROLLING MULTI-USE ARTICLE DISPENSING CELLS

Kerney J. Hurst, 507 Eagle Dr., Pineville, La. 71360

Filed Dec. 6, 1976, Ser. No. 747,956

Int. Cl.[2] B65G *47/44;* **B65B** *57/20*

U.S. Cl. 221—7 **9 Claims**



1. Control circuitry for a dispensing apparatus for dispensing items to an output location, said control circuitry operating in conjunction with a master control unit including an article counter and associated circuitry; said control circuitry including start means for initiating operation of said dispensing apparatus to affect dispensing of articles to be dispensed, means for generating a signal for incrementing the article counter as each article is dispensed, stop means responsive to a signal indicating the article counter has achieved a desired count to terminate operation of said dispensing apparatus and render said circuitry inoperative to reinstate operation of said dispensing apparatus, means for detecting removal of dispensed items from said output location and further means responsive to said means for detecting for permitting operation of said dispensing apparatus and for disabling said stop means.

4,171,066

AUTOMATIC VENDING MACHINE CAPABLE OF HEATING VENDED GOODS

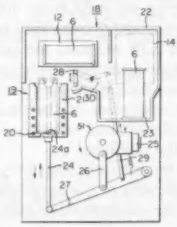
Kiyoshi Hirose, Ikoma, Japan, assignor to Matsushita Reiki Co., Ltd., Osaka, Japan

Filed May 11, 1977, Ser. No. 795,868

Claims priority, application Japan, May 17, 1976, 51-56904; May 17, 1976, 51-56905; May 17, 1976, 51-56906; Jun. 15, 1976, 51-78512[U]; Sep. 20, 1976, 51-127112[U]; Sep. 27, 1976, 51-116414; Sep. 30, 1976, 51-132483[U]

Int. Cl.[2] A47J *27/14*

U.S. Cl. 221—150 A **18 Claims**



1. An automatic vending machine capable of selectively heating a vended canned food, comprising:

(a) a cabinet,

(b) a storage space in said cabinet for storing there a number of food cans, said food cans are cylindrical with parallel end surfaces and a longitudinal axis perpendicular to said end surfaces,

(c) a goods dispenser responsive to a control signal to permit the delivery of one selected food can from said storage space,

(d) heating means for vertically receiving the upper portion and lower portion of a canned food and heating said food can when delivered therein,

(e) transfer means for transferring the heated food can from said heating means to a delivery opening, and

(f) turning means for inverting the heated food can to reverse the positions of the upper and lower portions of the canned food including means for turning said heated can end for end by rotating the can about an axis substantially perpendicular to the longitudinal axis of the can when the latter is transferred by said transfer means, thereby improving the uniformity of heat distribution within the heated can.

4,171,067
WEIGHING AND DISPENSING DEVICE

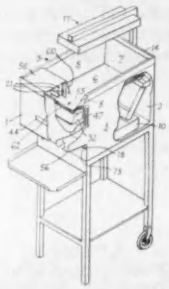
Keith Faulkner, Bexley, and David E. Appleford, Romford, both of England, assignors to Portionmat (Engineering) Limited, England

Filed Nov. 21, 1977, Ser. No. 853,828

Claims priority, application United Kingdom, Nov. 22, 1976, 48663/76

Int. Cl.[2] G01G *13/00*

U.S. Cl. 222—1 **10 Claims**



1. A method of weighing and dispensing a portion of hot, fried, potato products of predetermined weight, comprising:

(a) delivering a supply of potato products to a receptacle,

(b) vibrating the receptacle and thereby feeding the potato products towards weighing means comprising a hinged weighing platform disposed adjacent one end of the receptacle and in an enclosed path for the potato products,

(c) maintaining the supply of potato products hot in the receptacle,

(d) draining hot, frying oil or fat from the receptacle,

(e) continuing vibration and thereby feeding potato products into said enclosed path and onto the hinged platform,

(f) guiding said weighing platform so that it moves vertically and linearly downwards along said enclosed path as the potato products accumulate on the platform,

(g) detecting a predetermined weight of potato products accumulated on the platform,

(h) and in response thereto, releasing the platform and stopping vibration, whereby to discharge the potato products accumulated on the platform from said enclosed path.

4,171,068
STRIP POSITIONING IN LABEL PRINTERS

Jurgen Wenzel, Berlin, Fed. Rep. of Germany, assignor to Maschinenbau "WAM" M. Osterhof KG., Berlin, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 878,023

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706910

Int. Cl.[2] G03B *1/22*

U.S. Cl. 226—64 **4 Claims**

1. A strip positioning device for a label printer comprising:

a first shaft;

means for turning the shaft back and forth over particular angles;

a first pinion on the first shaft;

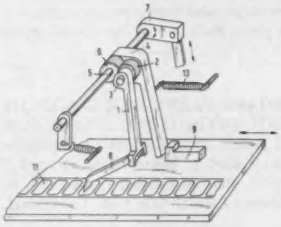
an adjusting lever journalled on the first shaft;

a second shaft journalled on the adjusting lever and extending parallel to the first shaft so that the azimuthal orientation of the second shaft varies upon pivoting of the adjusting lever about the first shaft;

a second pinion secured to the second shaft, and meshing with the first pinion, so that upon turning of the first shaft, the second shaft is turned also by operation of meshing of the first and second pinions;

a pivot lever on the second shaft and being pivoted upon turning of the second shaft;

transport means connected to the pivot lever for engagement with the strip; and



means for particularly, adjustably positioning the adjusting lever and releasibly holding it in the adjusted position.

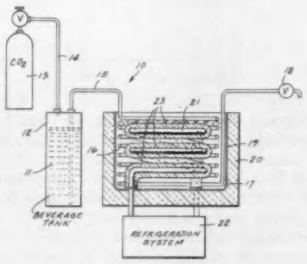
4,171,069
BEVERAGE DISPENSER

Richard T. Cornelius, Minnetonka, and Charles G. Erickson, Anoka, both of Minn., assignors to McQuay-Perfex Inc., Minneapolis, Minn.

Filed Jun. 29, 1977, Ser. No. 811,258

Int. Cl.[2] B67D *5/62*

U.S. Cl. 222—1 **7 Claims**



1. In a method for dispensing a beverage, using thin-wall high-density polyethylene tubing immersed in cold water as a heat exchanger for refrigerating a pressurized carbonated beverage as it passes therethrough.

4,171,070
APPARATUS FOR INSERTING AN ADDITIVE LIQUID INTO A FLOWING FLUID AND DISCHARGING THE RESULTANT MIXTURE

Samuel O. Colgate, and Robert A. Ramey, both of Gainesville, Fla., assignors to Samuel Colgate, Robert Ramey and Associates, Gainesville, Fla.

Filed Jun. 10, 1977, Ser. No. 805,302

Int. Cl.[2] B67D *5/56*

U.S. Cl. 222—133 **58 Claims**

34. A dispensing assembly for inserting a desired amount of an additive liquid into flowing water and discharging the resultant mixture comprising:

a container in which the additive liquid is stored;

an upwardly extending projecting portion formed at the top of said container and having a smaller diameter than said container;

threads formed on the external surface of said projecting portion;

an annular neck portion extending into said container through said projecting portion, said neck portion having a first larger diameter section having one end connected to

the top of said projecting portion by a solid web and a second smaller diameter section located below said first section, the connection between said first and said second sections forming a shoulder;

at least one additive liquid exit opening formed in said first section of said neck portion;

at least one water opening formed in said second section of said neck portion;

a closure member having an outer sealing portion to fit over said first section of said neck portion and an inner blocking portion to fit inside said second section of said neck portion, said blocking portion of said closure member having a head that slides with a snug fit in said second section of said neck portion and a smaller diameter leg that is attached to the base of said sealing portion, said blocking portion extending upwardly from said base of said sealing portion;

a closure biasing compression spring located between said head of said blocking portion and an inwardly extending lip at the bottom of said second section of said neck portion;

a sealing rim formed at the top end of said sealing portion of said closure member to slide over said first section of said neck portion with a liquid sealing fit while the remainder of said sealing portion has a greater diameter than the diameter of said first section of said neck portion to permit water flow between said first section of said neck portion and the internal surface of said sealing portion of said closure member, said sealing rim forming a liquid-tight seal with said first section of said neck portion and said

connecting web of said container under the urging of said closure biasing spring,

at least one water opening formed in said base of said sealing portion of said closure member;

a flexible pressure bag surrounding the bottom portion of said closure member and attached to the external surface of said sealing portion of said closure member with a liquid-tight seal;

an extension of said leg of said blocking portion of said closure member extending into said flexible bag beyond said base of said sealing portion to prevent said flexible pressure bag from expanding to the walls of said container and trapping additive liquid in the bottom of said container;

a metering plate located in said first section of said neck portion in abutment with said shoulder;

an orifice formed through said metering plate from the interior of said first section to the interior of said second section of said neck portion;

a dispenser body into which the water is inserted and from which the resultant mixture is discharged, said dispenser body having an annular depending skirt with threads formed on the internal surface thereof to engage mating threads on said projecting portion of said container to attach said dispenser body to said container;

a primary water pressure chamber formed in said dispenser body;

a plunger having a plunger disc located in said water pressure chamber, said plunger disc being free for movement in said pressure chamber but having a close enough fit to provide a generally water-tight sliding seal;

a pressure relief vent extending through said plunger disc, said relief vent having a size to pass a gas in said pressure chamber without actuating said plunger but without preventing the development of water pressure in said pressure chamber;

a secondary larger chamber located below said pressure chamber into which said pressure plate is forced upon the establishment of a water pressure in said pressure chamber that is in excess of a predetermined minimum pressure;

a plurality of extending guides formed in said secondary chamber to properly position said plunger plate for return to said pressure chamber;

a generally annular sleeve extending from said secondary chamber generally concentric with said depending skirt of said dispenser body and adapted to fit into said first section of said neck portion of said container, a mixing passageway being formed between the external surface of said sleeve and the internal surface of said first section of said neck portion;

a plunger stem attached to said plunger disc and extending through said sleeve, said plunger stem being aligned to fit into said orifice in said metering plate to form a metering port when said pressure disc is forced toward said secondary chamber;

an activating bias spring located along said plunger stem between said plunger disc and an inwardly extending lower lip of said sleeve;

at least one water opening formed in said inwardly extending lip of said sleeve; and

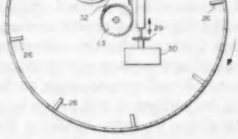
a passageway to convey water to said pressure chamber.

4,171,071

METERED FEEDER HAVING A ROTARY GROOVE AND A COOPERATING SCRAPER FOR DIFFICULT TO METER SOLIDS

Edward H. Cumpston, 43 Monument Ave., Old Bennington, Vt. 05201

Filed Jan. 13, 1978, Ser. No. 869,287
Int. Cl.[2] G01F *11/10*
U.S. Cl. 222—167 **8 Claims**



1. A continuous metering feeder for particulate solid material subject to feed rate variations from clogging, bridging, packing and accumulations, said feeder comprising:

(a) a generally cylindrical metering rotor having a continuous groove formed between axially spaced lands extending around said rotor;

(b) said rotor being oriented for rotating around a generally horizontal axis;

(c) means for continuously dropping said material directly in a free and unrestrained fall onto an upper region of said rotor at a rate substantially greater than the metering rate of said feeder for continuously overfilling said groove with said material piled loosely to a level above said lands;

(d) a scraper extending over said groove between the tops of said lands in said upper region for scraping away an excess portion of said loosely piled material above said lands to give said material remaining in said groove and rotating

past said scraper in said groove a predetermined and continuous cross-sectional shape throughout a region between said lands, said groove, and said scraper as said rotor turns;

(e) means for vibrating said scraper;

(f) said scraper being oriented at an acute angle to the tangent to said rotor in the region of said scraper;

(g) means for preventing said dropping material from entering said groove rotationally beyond said scraper; and

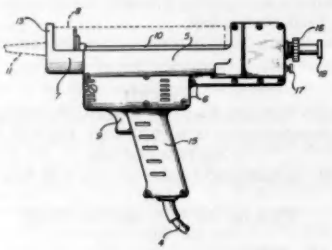
(h) means for continuously receiving said material falling from said groove as said material turns with said rotor past said upper region wherein said scraper is formed as a plurality of scrapers arranged in tandem in said upper region so said material is dropped onto said rotor to overfill said groove to a level above the lands in a region rotationally ahead of each of said scrapers, and said material is not dropped into said groove rotationally beyond said plurality of scrapers, each successive one of said scrapers improving the accuracy of said predetermined cross sectional shape.

4,171,072

HAND HELD ELECTRIC CAULKING GUN

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20034, assignor to Geo B. Davis, Jr., Bethesda, Md.

Filed Feb. 8, 1978, Ser. No. 876,048
Int. Cl.[2] B67D *5/46*
U.S. Cl. 222—326 **33 Claims**



1. A hand held electric caulking gun including in combination, a receptacle for receiving therein a caulk containing cartridge having a caulk dispensing nozzle, a piston movable when driven through said cartridge to force the caulking therein from said nozzle, a reciprocating surface, driving means for said reciprocating surface including an electric motor, a speed reducing drive train connecting said motor with said reciprocating surface whereby operation of said motor effects movement of said surface, piston gripping means movable by movement of said reciprocating surface to engage in gripping relation the surface of said piston to move said piston through said cartridge to force caulking therein from said nozzle and clutch means interposed between said motor and piston and operative to drivably interrupt movement between said motor and piston upon a predetermined movement arresting force being applied to the caulk driving end of said piston during operation of said motor.

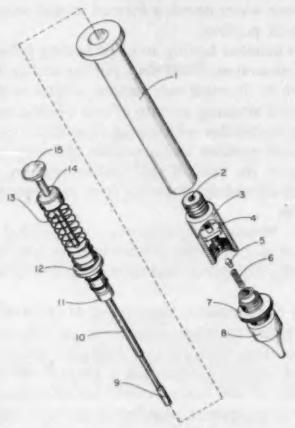
4,171,073

REPEATABLE FLUID DISPENSER

Herman C. Mann, San Francisco, and Robert N. Mann, San Bruno, both of Calif., assignors to 4M Biological Products and Services, San Francisco, Calif.

Filed Aug. 8, 1977, Ser. No. 822,883
Int. Cl.[2] B01L *3/02*; G01F *11/06*
U.S. Cl. 222—309 **1 Claim**

1. A repeatable dispenser comprising an elongated reservoir, a member having a calibrated cylindrical bore extending therethrough closing one end of the reservoir, a plunger extending longitudinally through said reservoir having a piston mounted at the end for reciprocating movement within said calibrated cylindrical bore, a dispenser tip carried by said member having a second bore alligned with said calibrated cylindrical bore, a stop adjustably mounted within said second bore and extending into said calibrated cylindrical bore to limit the downard



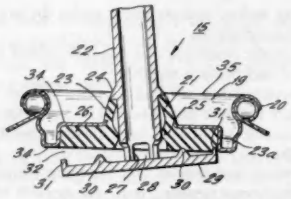
motion of said piston, a check valve permitting flow of fluid through the bore toward the tip and preventing flow in the opposite direction, and a spring acting to move the plunger and piston in the calibrated cylindrical bore to overcome atmospheric pressure acting upon the piston.

4,171,074

PRESSURE RESPONSIVE TILT VALVE FOR PRESSURIZED CONTAINER

George B. Diamond, R.D., Glen Gardner, N.J. 08826

Filed May 9, 1977, Ser. No. 795,114
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.22 **6 Claims**



1. A self regulating valve for use as the discharge valve of a pressurized container, said valve comprising:

a valve body; said valve body including a valve seat;

a hollow valve stem, having entrance ports located annularly around said stem and having an exit spaced away from said entrance ports along said stem;

a valve head at and secured to move with said valve stem and being located to one side of said entrance ports along said valve stem; said valve head bearing against said valve seat; means normally biasing said valve head against said valve seat; said stem is tiltable together with said valve head and relative to said valve seat; said entrance ports of said valve stem being at the side of said valve head to have entry of material to said valve stem entrance ports blocked by said valve head seating against said valve seat; said valve stem entrance ports being so placed as to be open to the discharge of material therethrough and into said valve

stem upon said valve head tilting and lifting off said valve seat;

said valve seat and said valve head both being annular and extending around said valve stem;

an annular sealing ring on said valve head spaced from said valve stem and in engagement with said valve seat for sealing flow past said sealing ring into said entrance ports of said valve stem;

said valve head including fulcrum means spaced radially further from said valve stem than said sealing ring; said fulcrum means facing in the same direction as said sealing ring with respect to said valve seat and said fulcrum means being in engagement with said valve seat; said valve stem and said valve head pivot about said fulcrum means when said valve stem is tilted, and upon such pivoting, said sealing ring is gradually raised off said valve seat starting at the side of said valve body toward which said valve stem is tilted, which gradually increases the size of the passage past said sealing ring and leading to said entrance ports;

said valve seat being comprised of a deformable, deflectable material which deflects under pressure thereupon through engagement of said valve seat with said sealing ring and said fulcrum means; said valve seat being yieldable and being adapted to deform to a greater extent under the bias thereagainst of said sealing ring and said fulcrum means as the pressure is higher in the container with which said valve is associated and said valve seat being adapted to deform to a progressively smaller extent under the bias thereagainst of said sealing ring and said fulcrum means as the pressure in the container decreases, whereby for a given amount of tilt of said valve head, the circumferential length of the section of said sealing ring that has raised off said valve seat and thus the size of the passage leading to said entrance ports is dependent upon the pressure in the container, and the change in size of the passage to said entrance ports maintains the rate of flow through said valve stem as container pressure changes.

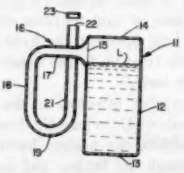
6. In combination, the self regulating valve of claim 1 and a container under pressure; said valve sealing said container; said exit of said valve stem being outside said container; said valve head and said valve seat being inside said container.

4,171,075

DISPENSING AND METERING CONTAINER

William J. Gangwisch, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,637
Int. Cl.[2] G01F *11/26*
U.S. Cl. 222—456 **7 Claims**



1. A container having means for dispensing predetermined quantities of fluid comprising a body adapted to contain a supply of fluid having closed ends and only a single opening for introduction and discharge of fluid, said opening being a side wall opening adjacent the top of said body when the container is upright and a hollow tubular member extending in a loop laterally outwardly from said body side opening and terminating outside the body in a dispensing opening disposed above the level of said body side opening when the container is upright, whereby when said container is tilted in one direction from upright position to dispose said body side opening at the underside of the body fluid is displaced from said body to provide a predetermined quantity of said fluid in said member and when said container is tilted in the opposite direction from said upright position to dispose said body side opening at the upper side of the container body and said dispensing opening below horizontal all of said fluid in said member will be dispensed from said member while no fluid will enter said member from said body, said tubular member comprising a section extending generally longitudinally of and in spaced relation to said body side wall whereby said loop forms a handle for the container.

4,171,076

MOLDS FOR MANUFACTURING PANTS

William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Brookhaven, Miss.

Division of Ser. No. 712,711, Aug. 9, 1976, Pat. No. 4,103,363. This application Mar. 6, 1978, Ser. No. 883,893
Int. Cl.[2] D06C *15/00*
U.S. Cl. 223—72 **4 Claims**

1. For use in molding a pair of tubes of heat-settable textile material adapted to constitute a pair of pants, said tubes being joined adjacent one end thereof at a crotch seam, to impart appropriate form to the tubes for a better fit, a molding form having a hip and thigh section and leg portions extending from the hip and thigh section, said hip and thigh section comprising a hip portion in the shape of the hip portion of the human figure and thigh portions in the shape of the thighs of the human figure, said leg portions comprising two flat leg members extending vertically from the hip portion in front-to-rear vertical central planes through the thigh portions, said form being adapted to have the tubes applied thereon with one tube on one leg member, the other tube on the other leg member and the joined end of the tubes on said hip portion, said hip and thigh section bulging out the outer side of one tube and the outer side of the other tube adjacent said one end of the tube, each of said leg members having front and rear thigh-creasing portions projecting out of the thigh portions of the hip and thigh section at both the front and rear of the thigh portions of the hip and thigh section, the edges of said thigh-creasing portions of said leg members being adapted to form creases in the thigh portions of said tubes.

4,171,077

BICYCLE CARRIERS FOR BUSES AND THE LIKE

J. Berchman Richard, Jr., 5634 Fallbrook Ave., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. No. 702,520, Jul. 6, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,619
Int. Cl.[2] B60R *9/10*
U.S. Cl. 224—42.03 B **10 Claims**

1. A bicycle carrier for buses and similar vehicles comprising:

a frame assembly;

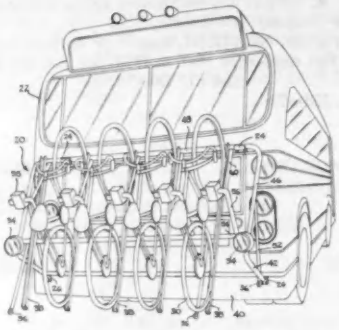
a plurality of channel members coupled to said frame assembly, said channel members being disposed in spaced apart disposition across the width of said frame assembly, each to receive a bicycle in the upright position aligned with

the axis of the bus and to guide the bicycle to a position with the front wheel substantially elevated with respect to the rear wheel of the bicycle;

lock means for locking each bicycle to the bicycle carrier; and

means for coupling said frame assembly to the rear of a vehicle, said means adaptable to variations in size of said vehicle; and wherein the upper portion of said frame assembly includes at least one upper horizontal bar adjacent the rear of the vehicle, and said means for coupling said frame assembly to the rear of the vehicle includes at least one hook-like member attached to said rear of said vehicle and forming a cradle on which said horizontal bar may rest, the lower portion of said frame assembly includes a lower horizontal bar and said means for coupling said frame assembly further includes at least one elongated member, a first end of said member provided with means for pivotal attachment to said lower horizontal bar and the second end of said member coupled to a lower portion of the back of such vehicle, said second end of said elongated member is pivotally mounted to a bracket member affixed to the lower portion of the rear of the vehicle, and said means for pivotal attachment of said first end of said member to said lower bar includes slide means to allow the location of said attachment of said first end to be varied along a portion of said lower horizontal bar;

whereby said carrier may be fitted to buses and similar vehicles of various sizes.



4,171,078

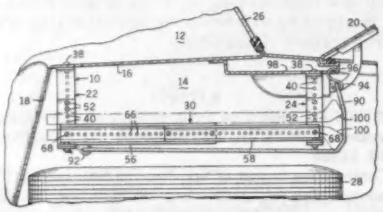
AUTOMOBILE TRUNK STORAGE RACK

Kent D. Morgan, 801 Rainbow Dr., St. Louis, Mo. 63125

Filed Mar. 13, 1978, Ser. No. 886,268

Int. Cl.[2] B60R *11/06*

U.S. Cl. 224—42.46 R **9 Claims**



9. A storage rack for an automobile trunk having an upper wall, said rack comprising:

(a) a first hanger means including:

(1) a pair of transversely spaced oppositely disposed brackets operatively attached to the upper wall of said trunk, each bracket including a downwardly depending leg,

(2) a transversely disposed strap having upwardly extending legs each connected to an associated bracket leg, and

(b) a second hanger means disposed in longitudinally spaced relation from said first hanger means said second hanger means including:

(1) a pair of transversely spaced oppositely disposed brackets operatively attached to the upper wall of said trunk, each bracket including a downwardly depending leg, and

(2) a transversely disposed strap having upwardly extending legs each attached to an associated bracket leg, and

(c) a pair of longitudinally extending rails disposed in side-by-side relation and carried by said first and second hanger means, each rail including vertically spaced inwardly extending flanges providing upper and lower bearing ledges for receiving flat storage articles thereupon.

4,171,079

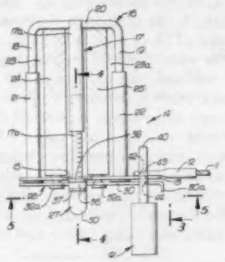
SKI LOCKING MECHANISM

Robert W. Dietlein, and William R. Dietlein, both of 3040 Deer Run Rd., Carson City, Nev. 89701

Continuation-in-part of Ser. No. 837,765, Sep. 29, 1977, Pat. No. 4,143,799. This application May 15, 1978, Ser. No. 905,596

Int. Cl.[2] B65D *71/00*

U.S. Cl. 224—45 S **8 Claims**



1. In an adjustable locking device, the combination comprising

(a) a laterally extending base defining a through opening,

(b) a retainer providing means to retain a pair of skis and having a first leg projecting perpendicularly toward the base, said leg including two sections with adjustably threaded interengagement to accommodate lengthening or shortening of said one leg,

(c) a head on one of said sections sized for free passage through said base opening, the head and said one section being rotatable relative to the other of said sections and relative to the base,

(d) a keeper movably attached to the base and having an opening therethrough to pass the head when the keeper is in a first position, the keeper having a locking second position in which the keeper and head have tongue and groove interconnection acting to block said head rotation and also to block perpendicular movement of the head relative to the keeper and base, and

(e) said head defining a groove extending generally normal to said laterally extending base, and said keeper defining a tongue which is shiftable into said groove only when said head has been rotated to bring said groove into alignment with said keeper tongue, said groove extending linearly and confined at one side of the head so that the tongue blocks rotation of the head when the tongue has entered the groove, and

(f) auxiliary locking means locking said keeper to said base, and having another opening on said keeper and which

comes into alignment with another opening of said base when said skis are to be locked within said retainer.

4,171,080

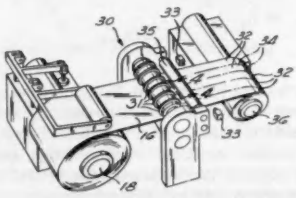
STEEL METAL WEB HANDLING METHOD

John W. Rogers, c/o 25550 Chagrin Blvd., Cleveland, Ohio 44122

Continuation of Ser. No. 818,794, Jul. 25, 1977, abandoned, which is a division of Ser. No. 713,599, Aug. 12, 1976, which is a continuation-in-part of Ser. No. 648,533, Jan. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 612,275, Sep. 11, 1975, abandoned. This application Feb. 16, 1978, Ser. No. 878,206

Int. Cl.[2] B26F *3/00*

U.S. Cl. 225—2 9 Claims



1. A method of handling an elongated web of sheet metal including dividing the metal into a plurality of strips including edge trim strips, winding all the strips into a plurality of daughter coils, and maintaining edges of adjacent strips connected together during the winding to a degree sufficient to constrain the daughter coils to form a parent coil consisting of a plurality of immediately adjacent daughter coils the outermost of which at one or both ends of the parent coils is an edge trim strip, transporting said parent coil with said edge trim strip in place for edge protection, and subsequently separating said edge trim strip associated with at least one end of the parent coil prior to or incident to separation of one or more of the other daughter coils.

4,171,081

APPARATUS FOR SEPARATING AND STACKING SHEETS OF PAPER OR THE LIKE

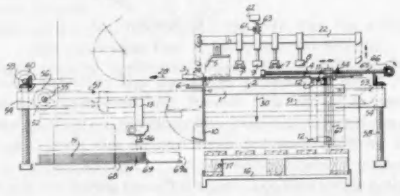
Franz Vossen, Brüggen, and Georg M. Vossen, Niederkrüchten, both of Fed. Rep. of Germany, assignors to Wupa-Maschinenfabrik GmbH, Brüggen, Fed. Rep. of Germany

Filed Jun. 10, 1977, Ser. No. 805,418

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1976, 2626630; Jul. 3, 1976, 2630094

Int. Cl.[2] B26F *3/02*

U.S. Cl. 225—97 12 Claims



1. Apparatus for stacking sheets of paper, cardboard and the like, which are delivered from a sheet punching machine and consist of useful and waste portions connected together by small fillets, and separating said sheets to form separate stack portions, comprising a supply device upstream of a sheet-punching machine for supplying punched, but not yet separated, sheets on to a planar severing table, severing tools movable relative to said planar severing table for severing said sheets into sheet portions to form separate stack portions, and a planar stacking surface for receiving said separate stack portions, means for vertically moving the severing table, said planar stacking surface being formed by a pallet, and means for laterally displacing said severing table to a first position laterally displaced from the pallet while said stack portions are held in position above said stacking surface and for moving said severing table again into position above said stack portions after the latter are deposited on said stacking surface.

4,171,082

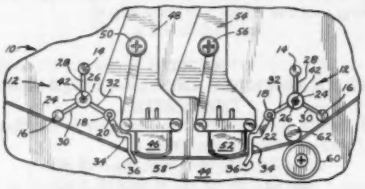
TAPE GUIDE

Dean W. Flygstad, St. Paul, and Michael I. Aronoff, Minneapolis, both of Minn., assignors to Telex Communications, Inc., Minneapolis, Minn.

Filed Feb. 16, 1978, Ser. No. 878,251

Int. Cl.[2] B65H *23/04*

U.S. Cl. 226—196 11 Claims



1. A vertically symmetrical tape guide for use on a base of a tape deck and positioned upstream and downstream of at least one tape head mounted on the tape deck and comprising;

a. three support means in a triangular configuration;

b. a mounting means positioned in between said support means;

c. connecting means between said support means and said mounting means;

d. arm means having one end attached to one of said support means; and,

e. spaced apart finger means extending horizontally from the other end of said arm means, whereby when a pair of tape guides are reciprocably disposed on each side of tape head, a tape is guided across a tape head and in between the spaced apart fingers of said tape guides.

4,171,083

DRILLING AND DRIVING DEVICE

Wolfgang Lippacher, Breitbrunn; Gerhard Teger, and Rudolf Reitberger, both of Munich, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Apr. 28, 1978, Ser. No. 901,237

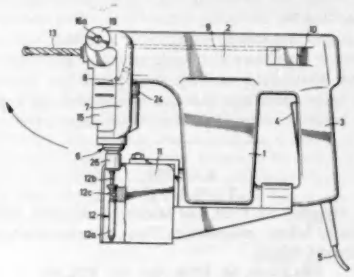
Claims priority, application Fed. Rep. of Germany, May 2, 1977, 2719574

Int. Cl.[2] B23B *51/08;* B25F *1/04*

U.S. Cl. 227—69 18 Claims

1. A drilling and driving device including a housing having a front end from which the drilling is effected and an oppositely directed rear end, a tool holder located in the front end of said housing, an axially extending drilling tool mounted in said tool holder, said tool holder arranged to transmit rotary motion to said drilling tool for effecting a drilling action, means in said housing for transmitting percussion motion to said drilling tool in the axial direction of said drilling tool, wherein the improvement comprises an axially extending percussion attachment pivotally mounted on the front end of said housing and pivotally displaceable between a first position with said attachment extending axially outwardly from the front end of said housing and with the axis of said attachment generally aligned with the axis of said drilling tool, and a

second position with the axis of said attachment extending transversely across the axis of said drilling tool, in its first position said attachment blocks said drilling tool from effecting

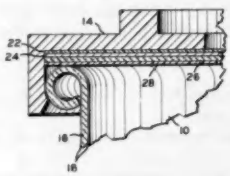


a drilling action and in its second position said attachment is pivotally displaced out of the path of said drilling tool so that the drilling tool can effect a drilling action.

4,171,084
CLOSURE ASSEMBLY AND CONTAINER SEALED THEREWITH

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 21, 1978, Ser. No. 926,600
Int. Cl.[2] B65D *53/04, 53/06, 5/02*
U.S. Cl. 229—43 **16 Claims**



1. A closure assembly comprising a sheet-form laminate adapted to rest upon the upper end of a conforming container and cover the opening therein and a thermoplastic ring comprising a generally planar portion and a downwardly depending skirt adapted to fit around the outside of a conforming container, wherein said generally planar portion of said ring is adapted to rest upon the perimeter of the upper surface of said laminate, wherein said laminate has on its upper surface at least in the area where the generally planar portion of the ring will rest thereon a first coating of a thermoplastic material and on its bottom surface at least in the area where the sheet-form member rests upon the upper end of the container a second coating of a thermoplastic material, and wherein said laminate includes a base material separating said first coating and said second coating.

4,171,085
TEAR TAB DISPOSABLE CUP OR CONTAINER STRUCTURE

William T. Doty, Towson, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

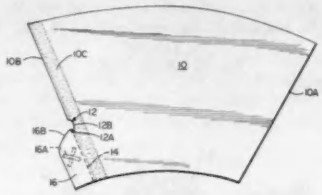
Filed Oct. 26, 1977, Ser. No. 845,793
Int. Cl.[2] B65D *3/06, 3/28*
U.S. Cl. 229—1.5 B **2 Claims**

1. In a container having a tubular sidewall with a substantially vertical lapped side seam extending from an open top curl configuuation to a closed bottom curl configuration, said side seam including a coextensive bonded area within the lapped confines of said side seam providing liquid-tight integrity to said container, the improvement comprising:

a sidewall blank having first and second side edges for forming respective exterior and interior layers of said lapped side seam; and

a tearable tab formed integral with said blank outboard of said first edge beyond the said bonded area of said side seam;

said tab being tearable along the outermost edge of said



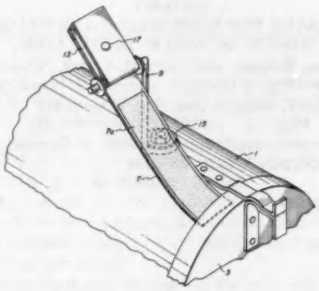
bonded area to preserve the liquid-tight integrity of said side seam while simultaneously defacing said container sufficiently to indicate prior use thereof; and

said tab further including a tear starting notch defined therein adjacent the outboard edge of said bonded area and directed to induce tearing substantially parallel to said outboard edge in response to a tearing stress on said tab, said tab extending from a point above said closed bottom curl around the apex thereof and being contiguous therewith.

4,171,086
SIGNAL DEVICE

Frederick W. Hudson, Henrietta, N.Y., assignor to Vencraft Corporation, West Henrietta, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,417
Int. Cl.[2] A47G *29/12*
U.S. Cl. 232—35 **10 Claims**

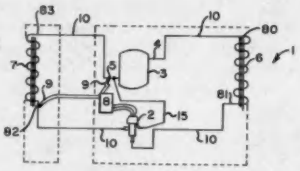


1. A signal device for a container, said container having a door means in one side thereof, said door means having a clearance between said door and container, comprising a pivot arm, a pivotally mounted signal arm on said pivot arm, said arm having a weight means on one end thereof, said pivot arm extending above said container a sufficient distance at the point of said mount to allow said weight means to pass between said pivot arm and said container upon rotation of said signal arm, allowing said signal arm to extend upward from said container in the signal position, the end of said signal arm opposite said weight means capable of being positioned in said clearance in the stored position, said signal arm being visible in both the stored and signal positions from any remote point from which the container is in view.

4,171,087
CONTROL VALVE

Bernard L. Kunz, Collinsville, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 3, 1977, Ser. No. 848,157
Int. Cl.[2] F16K *31/18*
U.S. Cl. 236—68 R **11 Claims**



1. An electrically operated valve, comprising:

a valve body, said valve body having a first opening and a second opening in it, and a fluid passage in said body communicating between said first and said second openings, said passage having a restriction formed in it;

valve means including a valve stem movably mounted between a first position closing said restriction, and a second position, said valve stem including seal means associated with it for sealing said stem against fluid flow;

means for biasing said valve stem towards said closed position;

heat motor means mounted to said valve body, said heat motor means being operatively connected to said valve stem, said heat motor means including an enclosure defining a chamber, a plurality of heater elements mounted to said valve stem, and a plurality of disc pairs mounted in heat transfer relationship with said heater means, expansion of said discs in one direction acting to move said valve toward an open position;

sensing means for sensing the temperature of said heat motor; and

drain means in said valve, said drain means having a first end and a second end, said first end being connected to the chamber of said heat motor, and said second end opening at a point external of said valve.

4,171,088
SYSTEM FOR HEATING BUILDINGS

Maurice Dumont, St-Ismier, and Gérard Marie, Eybens, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

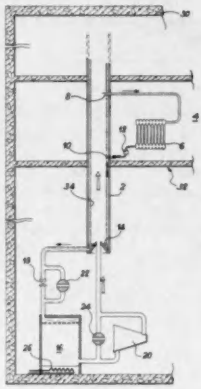
Division of Ser. No. 709,944, Jul. 29, 1976, Pat. No. 4,073,434. This application Dec. 2, 1977, Ser. No. 857,355
Claims priority, application France, Aug. 5, 1975, 75 24405
Int. Cl.[2] G05D *23/00*
U.S. Cl. 237—2 B **1 Claim**

1. A system for heating buildings, wherein said system comprises:

at least one vertical heating duct through which is passed an upward stream of vapor and a downflowing stream of condensate;

heating units placed in each of the premises to be heated and each comprising a condenser which is connected to one of the heating ducts at the upstream end by means of a branch pipe for drawing off vapor and at the downstream end by means of a condensate return pipe;

at the lower end of the heating duct, a liquid-vapor separator which collects the condensate and is followed by an expansion valve which is connected to an evaporator being supplied from an external heat source and which delivers

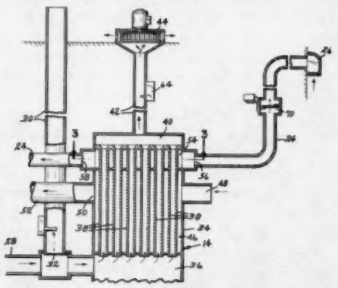


vapor to a compressor which is connected to the central portion of the heating duct.

4,171,089
HEAT EXCHANGER

George W. Schossow, 2316 Lilac La., White Bear Lake, Minn. 55110, assignor to George W. Schossow, White Bear Lake and Merchant, Gould, Smith, Edell, Welter & Schmidt, P.A., Minneapolis, both of, N. Mex. part interest

Filed May 19, 1977, Ser. No. 798,567
Int. Cl.[2] F24B *7/00*
U.S. Cl. 237—55 **4 Claims**



1. The combination of a home furnace system wherein the furnace burner draws combustion air from outside the home with a heat exchanger which cools stack gases and removes moisture therefrom before the stack gases are exhausted from the home, warms outside combustion air before it reaches the burner, and warms cool inside air before recirculating it through the furnace, said heat exchanger comprising:

(a) a plurality of vertically oriented tubes having lower ends in fluid communication with a conduit carrying stack gases from the furnace, and upper ends in fluid communication with a chimney;

(b) a combustion air chamber which extends around portions of said tubes adjacent their upper ends, said combustion air chamber being in fluid communication with a source of cold air exterior to the home and with the furnace burner;

(c) a cold return air chamber which surrounds portions of said tubes adjacent their lower ends, said return air chamber having a downstream outlet in fluid communication

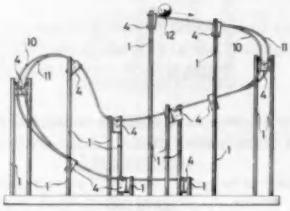
with the return air blower, and an upstream inlet in fluid communication with the ambient inside air of the home;
(d) a fan mounted in the chimney for inducing a draft up the chimney; and
(e) means for draining moisture of condensation which runs down the tubes.

4,171,090

TRACKWAY FOR A TRACKBORNE TOY

Rolf Eisenburg, No. 173, 5650 Wittkullerstrasse, Solingen-Wald, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 862,255
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658485
Int. Cl.[2] E01B *23/00*; A63H *21/00*
U.S. Cl. 238—10 R **7 Claims**



1. A trackway for a trackborne toy, the course of said trackway in both the horizontal and vertical planes being variable, said trackway comprising
(a) a plurality of vertical support means adapted to be arranged along a predetermined path;
(b) a pair of spaced elongated flexible track members;
(c) a plurality of bearing members supporting said track members in spaced parallel relationship at spaced intervals along the length of said track members;
(d) first means pivotally supporting each of said bearing members for adjustment about a horizontal axis; and
(e) second means supporting each of said first support means, said second support means including means adjustably engaging at least one of said vertical support means and adapted to permit positioning of said second support means at any selected position along the length of said vertical support means and to permit pivotal adjustment of said second support means along a vertical axis about said vertical support means;
(f) whereby each of said second support means may be independently raised or lowered on said vertical support means and pivoted about said vertical support means, and each of said bearing members may be pivoted to accommodate changes in the slope of said track member with respect to said vertical support means and in the course of said track members.

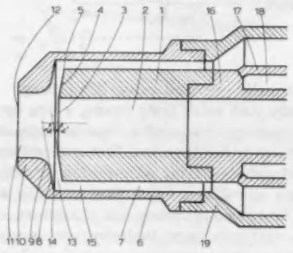
4,171,091

PROCESS AND DEVICE FOR SPRAYING LIQUID

Rudolf van Hardeveld, and Petrus F. A. M. Hendriks, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Division of Ser. No. 778,743, Mar. 17, 1977, Pat. No. 4,109,090. This application Jun. 1, 1978, Ser. No. 911,485
Claims priority, application Netherlands, Mar. 26, 1976, 7603164
Int. Cl.[2] A01N *17/02*; A62C *1/12*
U.S. Cl. 239—8 **26 Claims**

1. In a process for spraying a liquid by means of a two-phase sprayer using an atomizing gas wherein said sprayer is comprised of a liquid feed tube adapted for the supply of a liquid to be sprayed, terminating with a liquid outflow opening and positioned around the axis of the sprayer and coaxially with a gas feed tube adapted for the supply of atomizing gas and terminating with a sprayer outflow opening, said liquid and gas feed tubes being relatively positioned such that said gas feed tube extends beyond the liquid outflow opening of said liquid feed tube, the improvement wherein, in said sprayer,
said gas feed tube near the sprayer outflow opening has an inner wall section that tapers narrower towards the sprayer outflow opening, at an angle α of between 70° and 90° with respect to the sprayer axis, and continues by way of a rounded shoulder into a comparatively short outflow channel ending at said sprayer outflow opening, said rounded shoulder having a radius of between 0.1 and 0.4 times the smallest diameter of said outflow channel,



said liquid feed tube has an outer wall, and an end face between said outer wall and liquid outflow opening chamfered at an angle α' of between 70° and 90° with respect to the sprayer axis thereby forming a conical channel with an average apex of between 140° and 180° between said chamfered end face and the tapered inner wall section of the gas feed tube,
and further wherein the passage area of the conical channel at the end adjacent to said outflow channel is no greater than such passage area at any other place within said conical channel, the smallest passage area of said outflow channel is no greater than the smallest passage area of said conical channel, and the smallest diameter of the outflow channel is between 1.0 and 1.6 times the diameter of the liquid outflow opening.

4,171,092

FUMIGATION SYSTEM

Robert L. Ragsdale, Holliday, Mo., assignor to Clyde Ragsdale, Holliday, Mo., a part interest

Filed Dec. 16, 1977, Ser. No. 861,174
Int. Cl.[2] B05B *1/14*
U.S. Cl. 239—70 **10 Claims**

1. A fumigation system for dispersing pesticide comprising in combination:
a. conduit means adapted to be connected to a source of pressurized air;
b. valve means for controlling the flow of pressurized air in said conduit means;
c. timing means for controlling actuation of said valve means;
d. said conduit means having main line means and distribution line means;
e. said distribution line means being formed in at least one

loop like configuration which begins and ends in active communication with said main line means;

f. container means for containing pesticide means said container having pesticide means therein;

g. plural nozzle means connected by conduit to said distribution line means and to said container means; there being one container means for each said nozzle means;

h. each said loop-like configuration distribution line which is conduit connected to more than one nozzle means being connected to its respective nozzle means by respective conduits, the length of which conduits are inversely proportional to the shortest distance along said distribution line from said main line means that said nozzle means via its respective conduit is connected;

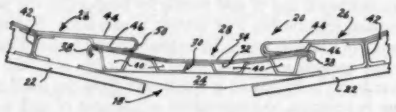
whereby compressed air passing from said main line means via said valve means when opened by said timing means, to said nozzle means via said distribution line means enters said nozzle means and draws said pesticide means from said plural container means and atomizes and sprays said pesticide means through said nozzle means into the space surrounding said nozzle means.

4,171,093

DURABILITY FLAP AND SEAL LINER ASSEMBLY FOR EXHAUST NOZZLES

Fred L. Honeycutt, Jr., Lake Park, and Donald R. Senterfitt, Jupiter, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1977, Ser. No. 826,226
Int. Cl.[2] B64C *15/06*
U.S. Cl. 239—127.3 **12 Claims**



1. In an exhaust nozzle having a plurality of flaps and seals circumferentially spaced along the inner periphery of said nozzle, the improvement therein being in the form of a flap and seal liner assembly operably connected to said plurality of flaps and seals, said flap and seal liner assembly comprising at least one seal liner and at least one flap liner in slidable engagement with one another, said seal liner having a corrugated support sheet operably connected to one of said plurality of seals, a grid sheet operably connected to said support sheet and a facesheet operably connected to said grid sheet, said flap liner having a support sheet operably connected to one of said plurality of flaps and in slidable engagement with said facesheet of said seal liner and a facesheet operably connected to said support sheet of said flap liner whereby said flap and seal liner assembly effectively separates the flow of gas over said facesheets from the flow of gas over said flaps and seals.

4,171,094

APPARATUS FOR MAKING USE OF WATER FOR HEALTH CARE

Norbert Halfen, Wingertsbergstr. 23, 5450 Neuwied 23, Fed. Rep. of Germany

Filed Nov. 1, 1977, Ser. No. 847,657
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650517; Mar. 23, 1977, 2712624
Int. Cl.[2] B05B *1/20*
U.S. Cl. 239—186 **3 Claims**

1. Apparatus for making use of water for health care, comprising:

a guide strut arranged for vertical attachment to a support means;

a slider cooperating with said guide strut;

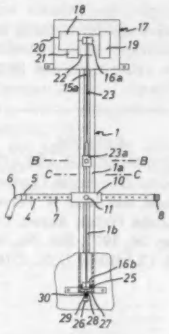
a spray tube means connected to said slider;

a connector on said spray tube means for a flexible water-supply pipe;

a threaded drive spindle associated with said guide strut, said drive spindle being arranged to effect up and down movement of said spray tube;

said drive spindle having a reversably rotatable drive means;

two spaced engagement members supported externally of said drive means; and



said drive means including a switch which serves to reverse the direction of rotation of said drive means, said switch being actuable by said two spaced engagement members;

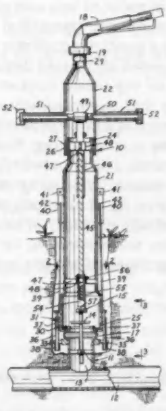
at its upper end, said threaded drive spindle having a section which has a considerably finer thread than that of said spindle proper, a threaded part, threadedly mounted on said section for respective-direction longitudinal movement upon rotation of said spindle, said threaded part having means for alternately engaging said two spaced engagment members for operating said switch.

4,171,095

SPRINKLER AND VALVE OPERATOR

Alton N. Filan, and A. LaVerne Filan, both of Rte. 1, Box 69, Waitsburg, Wash. 99361

Filed May 11, 1978, Ser. No. 904,793
Int. Cl.[2] B05B *15/06*
U.S. Cl. 239—200 **11 Claims**



1. A sprinkler and valve operator mountable directly to an irrigation pipe valve having an exterior valve actuator rotatable about a valve axis to open or close the valve, comprising:

a first pipe section having an upper end and a lower end;

mounting means at the lower end of the first pipe section

adapted to releasably secure the first pipe section to the irrigation pipe valve coaxially with the valve axis;

a second pipe section having an upper end and a lower end, said upper end of the second pipe section being adapted to rotatably mount a sprinkler head;

bearing means coaxially joining the upper end of the first pipe section and the lower end of the second pipe section for rotation relative to one another; and

valve operating means operably connected to the second pipe section and located within the first and second pipe sections for engaging the exterior valve actuator of an irrigation pipe valve and for opening or closing the irrigation pipe valve in response to manual rotation of the second pipe section relative to the first pipe section and irrigation pipe valve.

4,171,096

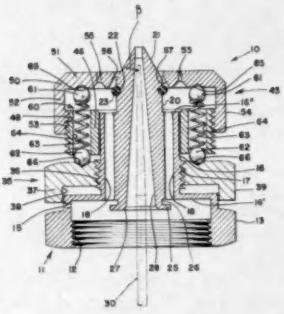
SPRAY GUN NOZZLE ATTACHMENT

John Welsh, 1136 Linmar Dr., North Canton, Ohio 44720; John V. Havrilla, Cleveland, and John W. Havrilla, Akron, both of Ohio, assignors to John Welsh, Akron, Ohio

Filed May 26, 1977, Ser. No. 800,862

Int. Cl.[2] B05B *1/28, 7/00*

U.S. Cl. 239—291 **11 Claims**



1. A nozzle for a spray gun for depositing liquid on a work surface comprising, body means having a channel communicating with a dispensing tip for the liquid, means for attaching said body means to the spray gun such that the liquid supplied from the spray gun is introduced into said channel of said body means, passage means for the transmittal of pressurized air from the spray gun to a position proximate said dispensing tip, air cap means circumposed about said dispensing tip, a plurality of orifices in said air cap means disposed circumferentially of said dispensing tip and communicating with said passage means for directing pressurized air jets axially of said air cap means, aperture means in said air cap means through which said dispensing tip extends axially outwardly of said orifices of said air cap means, means for spacing said aperture means relative to said dispensing tip of said body means to produce an annular air curtain radially inwardly of said orifices, whereby the liquid emitted from said dispensing tip is entrained within the confines of the pressurized air jets and deposited on the work surface.

4,171,097

AIRBRUSH

Jerome I. Rebold, Timonium, Md., assignor to CBS Inc., New York, N.Y.

Filed May 11, 1978, Ser. No. 904,846

Int. Cl.[2] B05B *7/30*

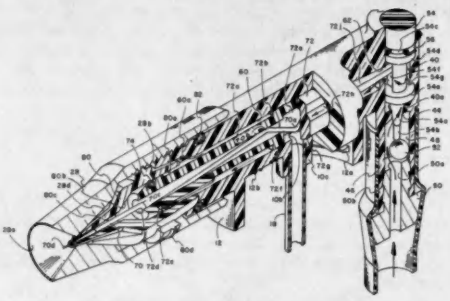
U.S. Cl. 239—341 **9 Claims**

1. An airbrush comprising:

a unitary elongated body having a generally cylindrical forward portion having an axial bore therein and an internally threaded cap depending therefrom for receiving a paint jar, a rearward portion extending rearwardly from said cylindrical forward portion, and a tubular portion depending from approximately the junction of said forward and rearward portions,

an internally tapered air cap threadably removably secured to the forward end of the cylindrical forward portion of said body and adapted for longitudinal adjustment forwardly from a rearwardmost position,

an externally tapered jet detachably secured within said air cap, said jet having an axial opening therethrough tapered toward a small opening at its forward end, and having at least one groove formed in its tapered external surface for the passage of air over the forward end of the jet,



an elongated needle having a tapered forward tip and a rearward end,

means secured within said axial bore detachably engaging the rearward end of said needle for supporting the needle in fixed relationship with respect to said body, said needle being of a length that its tip extends through and closes the small opening in said jet when said air cap is at said rearwardmost position and is withdrawn from the small opening in response to longitudinal adjustment of said air cap forwardly from said rearwardmost position, and

finger-operated valve means disposed within said depending tubular portion operable between a normally closed position and an open position for allowing air from a source of air under pressure to enter said axial bore when operated to its open position.

4,171,098

ELECTROSTATIC COATING GUNS

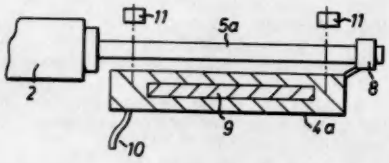
Franz Braun, Wartbüchel 14, 9422 Staad bei Rorschach, Switzerland

Division of Ser. No. 600,975, Aug. 1, 1975, Pat. No. 4,033,506. This application Apr. 18, 1977, Ser. No. 788,592

Claims priority, application Switzerland, Aug. 6, 1974, 10761/74; Aug. 6, 1974, 10762/74; Aug. 6, 1974, 10763/74

Int. Cl.[2] B05B *5/02*

U.S. Cl. 239—708 **5 Claims**



1. An electrostatic gun for coating material including a conduit for the delivery of coating material and an electrostatic generator for applying an electrostatic field to coating material passing through said conduit, said generator including an electrostatic cascade component and an insulating jacket surround-

ing said component and consisting of at least two contacting insulating layers lying one within the other and respectively having different dielectric constants and one of said insulating layers having a greater mechanical strength than the other one of said insulating layers.

4,171,099

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

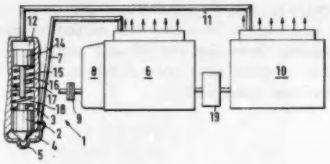
Odon Kopse, Stuttgart; Richard Kinzel, Ditzingen; Ewald Eblen, Stuttgart; Willi Voit, Stuttgart; Gregor Schuster, Stuttgart, and Franz Eheim, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,247

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558790

Int. Cl.[2] F02M *47/02*

U.S. Cl. 239—533.8 **21 Claims**



1. A fuel injection nozzle having a bored body, axially spaced chambers in said body, a fuel supply inlet and a fuel discharge outlet, a fluid pressure operated needle valve extending into one chamber and a closure spring for said needle valve in another of said chambers arranged to cooperate with said needle valve, wherein the improvement comprises an hydraulically actuated intermediate piston including upper and lower working surfaces one of which is subjected to pressure in the spring chamber and another of which is subjected to fluid pressure in the chamber provided immediately above said spring chamber, and said fluid pressure chamber being connected to a line leading to a pump whereby closing pressure on the needle valve may be increased in a controlled manner.

4,171,100

ELECTROSTATIC PAINT SPRAYING APPARATUS

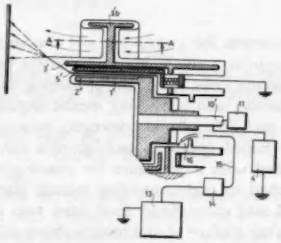
Gyorgy Benedek; Andras Bese; Jozsef Domokos, and Istvan Kovacs, all of Budapest, Hungary, assignors to Hajtomuvek es Festoberendezesek Gyara, Budapest, Hungary

Filed Nov. 7, 1977, Ser. No. 849,016

Claims priority, application Hungary, Nov. 10, 1976, HA 1029

Int. Cl.[2] B05B *5/04*

U.S. Cl. 239—700 **8 Claims**



1. Electrostatic spraying apparatus comprising a spraying head, a multiple electrode arrangement forming part of said head and including two high voltage electrodes one of which has at least a portion that is uninsulated; a further electrode that is grounded; a paint flow space in said head defined partly by said uninsulated portion of one of the high voltage electrodes and by said grounded electrode, the other of said high voltage electrodes being spaced outwardly from the grounded electrode and being provided with an insulating layer both on its outer side and on its side facing said grounded electrode; and, an insulated airflow blade ring formed and electrically connected as a high voltage electrode, the blade ring being mechanically connected to the outer high voltage electrode.

4,171,101

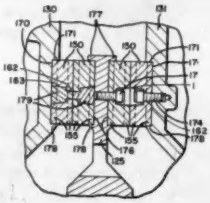
METHOD OF OPERATING A DISK REFINER PROVIDED WITH REVERSIBLE REFINING PLATES

Peter Seifert; David E. Chupka; Lynn L. Getz; Derald R. Hatton; R. Marvin Thomas; John M. Osso, and Herbert A. Rogl, all of Middletown, Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Division of Ser. No. 690,548, May 27, 1976, Pat. No. 4,081,147. This application Feb. 22, 1978, Ser. No. 879,853

Int. Cl.[2] B02C *7/12*

U.S. Cl. 241—30 **1 Claim**



1. The method of operating a disk refiner including a stator and rotor having opposing faces which comprises the steps of

(a) providing an annular refiner plate having a working surface on each side thereof composed of alternating bars and grooves,

(b) securing said refiner plate on one of said opposing faces with one of said working surfaces seated in face to face engagement with said face and the other said workin surface exposed,

(c) operating said refiner until said exposed working surface is substantially worn away,

(d) removing said refiner plate from said face,

(e) grinding said worn surface of said refiner plate into substantial parallelism with the remaining said working surface thereon, and

(f) securing said refiner plate on one of said faces with said ground surface thereof engaging said face.

4,171,102

PARTITIONS FOR A TUBE GRINDING MILL

Pierre A. Slegten, 158, Ave. du Prince d'Orange, Brussels, Belgium

Filed Feb. 24, 1978, Ser. No. 880,988

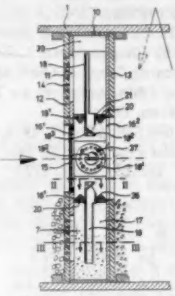
Claims priority, application Belgium, Feb. 25, 1977, 851835

Int. Cl.[2] B02C *17/18*

U.S. Cl. 241—70 **5 Claims**

1. In a tube grinding mill forming a drum containing grinding media, said drum rotating on its longitudinal axis to tumble said media, a partition extending along the cross-section of said drum and comprising an upstream wall provided with inlet openings, a downstream wall, an outer peripheral wall connecting said upstream wall with said downstream wall, said downstream wall being provided with a central discharge opening, an inner peripheral wall surrounding said central discharge opening and connecting said downstream wall with said upstream wall thus forming a polygonal envelope defining a central discharge area in the partition and also defining with said downstream wall, said upstream wall and said outer peripheral wall an annular reservoir chamber coaxial with said

central discharge area, said inlet openings of the upstream wall permitting entry of material ground to a determined extent into said reservoir chamber while retaining the grinding media and insufficiently ground material outside of said chamber, passages through said envelope connecting said reservoir chamber with said central discharge area, scoops defining said passages, a portion of each scoop extending within said reservoir chamber and forming a semicylindrical member, another portion of each scoop extending in the central discharge area and forming



a deflector member, the rotation of the tube mill causing part of the material within the reservoir chamber to be entrained by the scoops above the mill axis and from there to slide down each scoop towards its deflector member which diverts material towards the discharge opening, each scoop as well as the peripheral area surrounding each corresponding passage in the polygonal envelope comprising cooperating means for rotating the scoop about its longitudinal axis for varying the holding volume of the portion of the scoop extending within the reservoir chamber.

4,171,103

APPARATUS FOR COMMINUTING WASTE MATERIALS

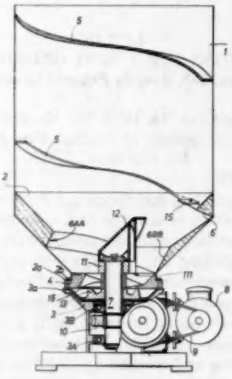
Kurt Rössler, Belm, Fed. Rep. of Germany, assignor to Max Frost, Maschinen- und Apparatebau, Berlin, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,752

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701897

Int. Cl.[2] B02C *18/06*

U.S. Cl. 241—152 A **25 Claims**



1. In a comminuting apparatus, particularly for waste materials or the like, the combination of

(a) a housing having an opening for admission of material to be comminuted, said housing including a downwardly tapering upright section having an inner side;

(b) a comminuting unit including a stationary counterknife disposed below said section and comprising a substantially ring-shaped outer portion having an inner side disposed below the inner side of said section and at least one arm extending inwardly from said outer portion and having a cutting edge, said arm defining a passage for the material which descends beyond said section, and at least one rotary knife adjacent to said counterknife and having at least one cutting edge cooperating with the cutting edge of said counterknife to sever the material which descends beyond the inner side of said section, at least the inner side of said upright section having a downwardly sloping material-advancing spiral surface and said spiral surface including an upper portion which flares downwardly and outwardly at a gradually decreasing angle to the axis of said section and a lower portion which flares upwardly and outwardly at a gradually increasing angle to said axis; and

(c) a rotary feeding device disposed above said counterknife and including at least one arm extending upwardly and outwardly from the axis of said section and having a helical or spiral edge portion whose lead is opposite to that of said spiral surface.

4,171,104

APPARATUS FOR CONVEYING AND TRANSMUTING METAL CHIPS

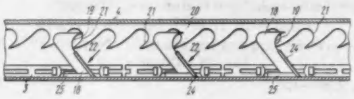
Valery A. Kunitsyn, and Mirsaid M. Rakhimkulov, both of Kazan, U.S.S.R., assignors to Kazansky Aviatsionny Institut Imeni A. N. Tupoleva, Kazan, U.S.S.R.

Continuation of Ser. No. 776,113, Mar. 10, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 917,935

Claims priority, application U.S.S.R., May 10, 1976, 2361714

Int. Cl.[2] B02C *18/16*

U.S. Cl. 241—160 **8 Claims**



1. An apparatus for conveying and transmuting chips by crushing comprising conveying means in the form of a chain conveyor having links; a trough for loading and transmuting said chips having said conveying means disposed in it; rakes attached to said links of said conveying means; a plurality of inverted L-shaped grapples, each grapple having a leading edge provided with a curvature for coarse crushing of said chips, attached to said conveying means; blades for coarse crushing of said chips fitted in at least two rows within a portion of a top surface of said trough above said rakes so that said L-shaped grapples pass between adjacent rows of said blades when said conveying means is set into motion, a cutting edge of each of said blades facing said leading edges of said grapples and having a curvature whose radius is approximately equal to the radius of the curvature of said leading edges of each of said grapples.

4,171,105

DEVICE FOR PLACING A COP WITH ITS YARN PULLED OUT INTO A MOVABLE STORAGE POINT

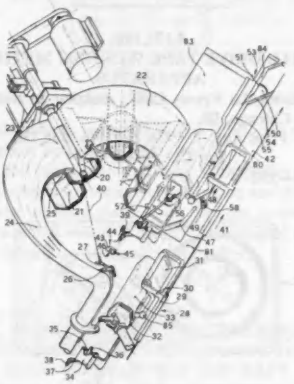
Armando D'Agnolo, and Giovanni Favero, both of Pordenone, Italy, assignors to Officine Savio S.p.A., Udine, Italy

Continuation of Ser. No. 687,217, May 17, 1976, abandoned, which is a continuation of Ser. No. 474,587, May 30, 1974, abandoned. This application Apr. 18, 1977, Ser. No. 788,685

Claims priority, application Italy, May 30, 1973, 83378 A/73

Int. Cl.[2] B65H *54/22*

U.S. Cl. 242—18 R **10 Claims**



1. A device for transferring a cop with a yarn end pulled out into a compartment having a longitudinal axis of a movable storage member from a step-by-step conveyor compartment with a longitudinal axis positioned parallel to the longitudinal axis of the movable storage compartment at a point of transfer comprising a fixed means to retain the yarn end on the cop when found, pivotal fork means, which can be positioned at an angle and which transfers cops from the step-by-step conveyor compartment to the compartment of the movable storage member,

a pincer means, which can be opened and which retain the end of the yarn when found, integrally fixed to and located on the top of each compartment of the movable storage member,

a means for verifying the presence of the end of the yarn positioned above said pincer means,

shears positioned with said verifying means for cutting extending yarn between said fixed means and said pincer means, and

a control device reactive to said verifying means positioned to discharge a cop having a yarn end which has not been found, said pincer means, verifying means and shears lying within a common plane.

4,171,106

METHOD OF CONTINUOUS WINDING

Jere W. Crouse, Beliot, Wis., assignor to Beliot Corporation, Beliot, Wis.

Filed Mar. 31, 1978, Ser. No. 892,216

Int. Cl.[2] B65H *17/08*

U.S. Cl. 242—66 **10 Claims**

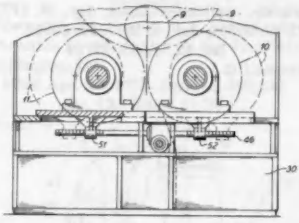
1. In a winder for winding a continuous traveling web of sheet material onto a core, the combination comprising:

first and second winder drums positioned in parallel side-by-side relationship rotatable on parallel horizontal axes for providing vertical support for a winding roll of sheet material and arranged to rotate in the same direction;

support means for said drum accommodating relative movement of the axes for changing the lateral spacing of the drums;

a rider roll centrally mounted above said winder drums for vertical movement relative thereto;

electronic sensing means carried on said rider roll to monitor the size of a roll being wound;



and drum positioned means controlled by said sensor means for moving said rolls continuously laterally apart at adjustable speed as a function of increase in size of the roll being wound for reducing the amplitude of bounce of the roll being wound and affecting the frequency of bounce for improved winding.

4,171,107

WINDING-UP DEVICE FOR PAPER WEBS, ESPECIALLY WIDE PAPER WEBS ON A DRIVEN CYLINDER

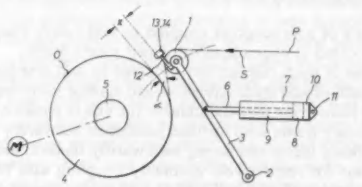
Franz Kayser, Kerken; Richard Rauf, Krefeld; Wimmar Schmitz, Kempen, and Jürgen Schlunke, Krefeld, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,687

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724935

Int. Cl.[2] B65H *17/02, 23/10*

U.S. Cl. 242—67.1 R **6 Claims**

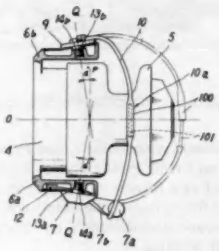


1. A winding-up device for paper webs, which includes: a rotatable winding-up cylinder for receiving and winding up a paper web, a rotatable guiding roller, two cylinder-piston means operatively connected to opposite ends respectively of said guiding roller for tilting the same toward and away from said cylinder, two pitot tubes associated with and respectively directed toward the end portions of said guiding roller and adjustable toward and away from each other, each of said cylinder-piston means having a cylinder with a reciprocable piston therein dividing said cylinder into a first and a second cylinder chamber, first and second converter containers adapted respectively to be subjected to different pressures, first conduit means for establishing communication between said first converter and said first cylinder chambers, control valve means associated with said first converter container for selectively placing said first converter container under pressure and relieving said first container from pressure, second conduit means for establishing fluid communication between said second converter container and said second cylinder chambers, two 2/2 way valves respectively associated with said second cylinder chambers, and two check valves respectively arranged in parallel to said 2/2 way valves, said pitot tubes and said converter containers being connectable to a common compressed air network.

4,171,108
SPINNING TYPE FISHING REEL

Takuo Ishida, Sennan, and Masuo Ban, Sakai, both of Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 11, 1978, Ser. No. 895,381
Claims priority, application Japan, Apr. 19, 1977, 52/45258; Jun. 7, 1977, 52/67511; Jur. 7, 1977, 52/67512
Int. Cl.[2] A01K *89/01*
U.S. Cl. 242—84.2 G 11 Claims

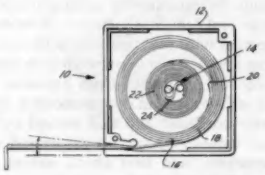


1. A fishing reel comprising;
a reel body having a handle projecting therefrom and a mounting leg for mounting said reel body to a fishing rod;
a cup-like shaped rotary frame rotatably supported to said reel body at the front thereof;
a spool supported to the front of said reel body by means causing said spool to move longitudinally of said reel body upon movement of said handle;
a bail arm of semicircular shape for guiding a fishing line wound on said spool including an intermediate portion and two end portions; and,
means for pivotably mounting said bail arm to said rotary frame so that said bail arm can swing with its intermediate portion passing across the front side of said spool comprising:
a pair of arm supports coupled to said rotary frame and located at opposite sides of said rotary frame,
a pair of studs respectively mounted to said arm supports, each of said studs having its axis slanted with respect to a plane lying perpendicular to the axis of rotation of said rotary frame with its head positioned outwardly of said rotary frame and facing backwardly thereof, and
means for respectively pivotably coupling said two end portions of said bail arm to said studs, whereby when said bail arm is swung about said studs, said intermediate portion thereof is shifted radially to pass across the front side of said spool.

4,171,109
TAPE MEASURE CASING

Alfred W. Roe, Bellport, N.Y., assignor to Roe International, Inc., Patchogue, N.Y.

Filed Apr. 25, 1978, Ser. No. 899,781
Int. Cl.[2] B65H *75/48*; G01B *3/10*
U.S. Cl. 242—107 13 Claims

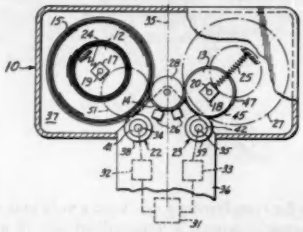


1. A tape measure casing for a retractable tape measure including a coil spring secured to the tape measure, said casing comprising an outer shell and a central interior mounting structure for attachment to the inner end of said coil spring, said mounting structure comprising a cylindrical post centrally located in said casing and having a generally S-shaped slot formed therein along its central axis receiving the inner end of the spring, said slot defining walls in said post which provide guiding means for guiding said inner end of the coil spring in a smooth relatively large radius curve about the mounting structure to the first inner turn of the coil spring thereby to avoid sharp bends in the spring and permit the use of unannealed spring steel to form said spring.

4,171,110
PERIPHERAL DRIVE TAPE WINDING METHODS AND APPARATUS

Robert D. Hawn, La Verne, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 7, 1978, Ser. No. 931,784
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—192 12 Claims



8. In apparatus for winding a tape having a leader, the improvement comprising in combination:
a tape winding hub;
peripheral drive capstan means including an outer sleeve of elastic material and a circumferential recess having a predetermined depth;
means for biasing said tape winding hub and said peripheral drive capstan means toward each other and for juxtaposing said tape winding hub and said peripheral drive capstan means for rotation about parallel axes;
means for spacing said sleeve of elastic material from said tape winding hub, including a circumferential rim on said tape winding hub having a height larger than said predetermined depth and engaging said peripheral drive capstan in said recess;
a longitudinal groove in said leader for accommodating said rim; and
means coupled to said capstan means for winding said leader having said groove for accommodating said rim and said tape with said peripheral drive capstan means on said tape winding hub.

4,171,111
DRIVE MECHANISM FOR A TAPE RECORDER

Karl Herleth, Munich, Fed. Rep. of Germany, assignor to Firma Magnetronic Gesellschaft fur Elektronisch-Mechanisch Gerate mbH & Co. Entwicklungs KG, Munich, Fed. Rep. of Germany

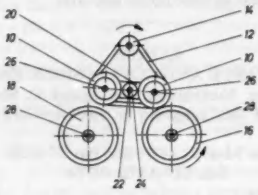
Filed Dec. 5, 1977, Ser. No. 857,288
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—201 7 Claims

1. In a magnetic tape recorder of the type having two winding plates, a capstan drive and tape drive mechanisms, with a single motor for driving the capstan, as well as the winding plates, the improvement which comprises:
the tape drive mechanism having a separate winding motor for selectively driving one of the winding plates in one

direction, and the other one in the opposite direction thereof;

a driving pulley disposed above the winding motor, and rotated by the same about its axis;

a reversible lever freely pivoted about an axis parallel to the axis of rotation of the driving pulley;



two friction wheels mounted on the lever, one on each side of the pivot axis of the lever; and

a toothed belt running around the driving pulley and the two friction wheels for selectively engaging and driving either one of the winding plates, such that the torque generated by the winding motor is directly transmitted through the belt to either one of the winding plates.

4,171,112

V.S.T.O.L. AIRCRAFT WITH CONTROL MEANS FOR MAINTAINING SUBSTANTIALLY EQUAL THRUST ON BOTH SIDES OF THE AIRCRAFT

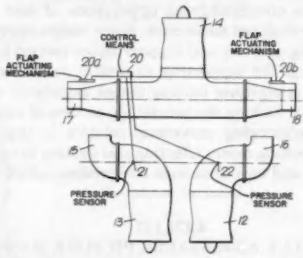
Harry M. Harvey, Allestree, England, assignor to Rolls-Royce Limited, London, England

Filed Jul. 5, 1978, Ser. No. 922,051

Claims priority, application United Kingdom, Jul. 29, 1977, 32070/77

Int. Cl.[2] **B64C** *15/02, 15/08;* **B64D** *27/14*

U.S. Cl. 244—12.5 **5 Claims**



1. A V.S.T.O.L. comprising:

two gas turbine propulsion engines, each of which includes a pivotable exhaust nozzle, the pivotable exhaust nozzle of one of said two gas turbine engines being arranged on one side of the aircraft and the pivotable exhaust nozzle of the other of said two gas turbine propulsion engines being arranged on the opposite side of the aircraft;

a third gas turbine propulsion engine including two pivotable exhaust nozzles, one of which is arranged on one side of the aircraft and the other of which is arranged on the opposite side of the aircraft;

and means within each of the pivotable nozzles of said third gas turbine propulsion engine for controlling efflux of gases therefrom, one of said means within one of said pivotable nozzles of said third engine being operable by at least partial failure of one of said two gas turbine propulsion engines and the other of said means within the other of said pivotable nozzles being operable by at least partial failure of the other of said two gas turbine propulsion engines whereby substantially equal thrust is maintained on both sides of the aircraft.

4,171,113

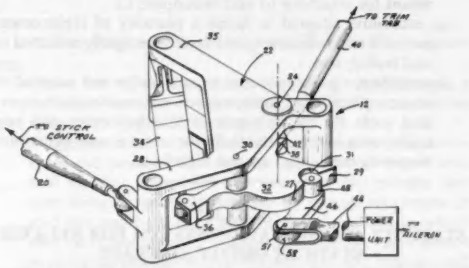
SHIFT MECHANISM FOR AIRCRAFT CONTROL SYSTEM

Richard E. Townsend, Huntington, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 20, 1978, Ser. No. 898,048

Int. Cl.[2] **B64C** *13/28*

U.S. Cl. 244—83 G **10 Claims**



7. A shift mechanism comprising a housing, said housing being pivotally connected to a support structure, means operably connected between an actuator and said housing for moving said housing about its pivotal connection in response to signals from said actuator, a connecting member pivotally connected to said housing, means operably connected between said housing and said connecting member for moving said connecting member between a first and a second position, said connecting member being pivotally connected to a first driven member, said pivotal connection between said connecting member and said first driven member being coincidental with said pivotal connection of said housing to said support structure when said connecting member is in said first position, an idler arm pivotally connected to said housing and in operative relationship with said connecting member, said pivotal connection of said idler arm being coincidental with said pivotal connection of said housing to said support structure and said idler arm being pivotally connected to a second driven member whereby when said connecting member is in said first position said second driven member is responsive to the movement of said housing and when said connecting member is in said second position said first driven member is responsive to the movement of said housing.

4,171,114

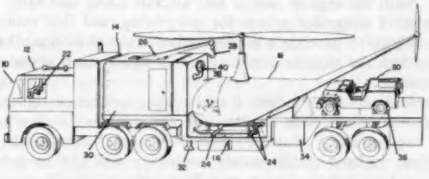
MOBILE AERIAL SUPPORT SYSTEM

Jay W. Marden, 2337 N. 21st Ave., Hollywood, Fla. 33020

Continuation-in-part of Ser. No. 719,939, Sep. 2, 1976. This application Sep. 30, 1977, Ser. No. 838,147

Int. Cl.[2] **B64F** *1/00*

U.S. Cl. 244—116 **4 Claims**



1. A mobile aerial support system for detachably transporting and providing ground support system for a helicopter, said

helicopter having a first two-way radio communication device, comprising:

a tractor adapted to pull a trailer and having a cab;

a second two-way audio communication device mounted interiorly of said cab;

a modified drop-frame trailer adapted to detachably connect to said tractor;

means for detachably mounting a helicopter rigidly mounted to the top of said trailer;

a tank adapted to contain fuel for said helicopter, said tank rigidly mounted to said trailer;

a crane rotatably rigidly mounted to said trailer said crane having a boom extending to a point upwardly adjacent said helicopter mounting means and having an extendable means for attaching to said helicopter;

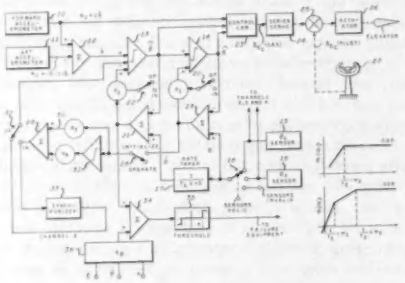
an enclosure, adapted to house a plurality of replacement parts for said helicopter, said enclosure rigidly mounted to said trailer; and

a workshop, rigidly mounted to said trailer and adapted to house a plurality of handpowered and mechanically operated tools for use in repair of said helicopter and said trailer on a level substantially the same as said helicopter mounting means and spaced therefrom.

4,171,115
STABILITY AUGMENTATION SYSTEM FOR RELAXED STATIC STABILITY AIRCRAFT

Stephen S. Osder, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,410
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—181 **25 Claims**



1. A stability augmentation system for aircraft having control surface means for controlling said aircraft about an axis thereof comprising

first and second linear accelerometer means mounted in said aircraft for providing first and second linear acceleration signals,

combining means for combining said first and second linear acceleration signals for providing a signal in accordance with the angular acceleration of said aircraft about said axis,

first integrator means for integrating said angular acceleration signal to provide a first estimate signal in accordance with the angular rate of said aircraft about said axis,

second integrator means for integrating said first estimate signal to provide a second estimate signal in accordance with the angular displacement of said aircraft about said axis,

reference sensor means for providing reference signals in accordance with angular rate and angular displacement, respectively, of said aircraft with respect to said axis,

first washout circuit means, including said first integrator means, responsive to said first estimate signal and said angular rate reference signal for washing out steady state differences therebetween,

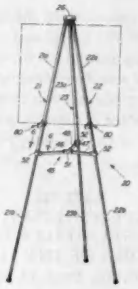
second washout circuit means, including said second integrator means, responsive to said second estimate signal and said angular displacement reference signal for washing out steady state differences therebetween, and

control means responsive to said first and second estimate signals for providing control signals to said control surface means in accordance with a combination thereof for stabilizing said aircraft about said axis.

4,171,116
ADJUSTABLE AND COLLAPSIBLE EASEL

George E. Carver, Northbrook, and Joseph C. Sindelar, Glen Ellyn, both of Ill., assignors to Beckley-Cardy Company, Chicago, Ill.

Filed Mar. 3, 1977, Ser. No. 774,134
Int. Cl.[2] A47B *97/04*
U.S. Cl. 248—464 **13 Claims**

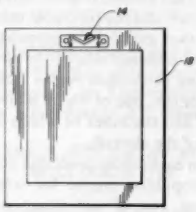


1. In an adjustable and collapsible easel adapted to be mounted in an upright position and including a plurality of elongated legs, each of said legs including a first tubular section having upper and lower ends and a second section mounted in said first section for telescoping movement relative thereto, means connecting the upper ends of said first leg sections for articulated movement, brace means interconnecting said first leg sections, and support means carried by at least one of said legs for supporting an article on said easel, the improvement comprising locking means associated with said brace means for locking the second leg section of each of said legs against telescoping movement relative to said first leg section, said locking means effecting said locking in response to movement of said legs to at least one predetermined position.

4,171,117
MANUALLY ADJUSTABLE PICTURE HANGER

John J. Prochaska, 316 Oswego, Park Forest, Ill. 60466

Filed Apr. 10, 1978, Ser. No. 894,733
Int. Cl.[2] A47G *1/24*
U.S. Cl. 248—495 **8 Claims**



1. A hanger for attaching a picture frame to a wall and for manually adjusting the position of said frame to a stable level attitude without detaching said frame from said wall, comprising

generally flat bracket means defining a first opening and an elongated second opening;

means for affixing said bracket means to a picture frame;

a first probe including a shank extending through said first opening and abutting against an upper edge portion of said bracket means facing said first opening, a first flange extending laterally outwardly of said first probe and including a portion adjacent to and forward of said bracket means in frictional abutment with both said frame and said bracket means, and means for attaching said first probe to a wall;

a second probe including a shank extending through said second opening and abutting frictionally against an upper edge portion of said bracket means facing said second opening, a second flange extending laterally outwardly of said second probe and including a portion adjacent to and forward of said bracket means in frictional abutment with both said frame and said bracket means, and means for attaching said second probe to a wall;

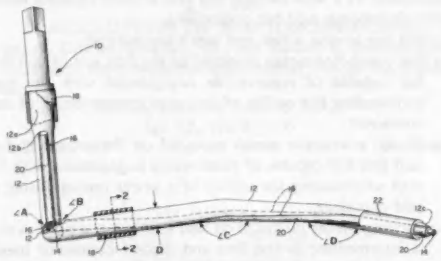
whereby upon affixing said bracket means to a rear portion of said picture frame and attaching said first probe and said second probe to a wall, manual force applied to said picture frame pivots said bracket means about said second probe to adjust said picture frame to a level attitude.

4,171,118

MANDREL ASSEMBLY FOR VULCANIZING A VENT TUBE WITHIN THE BORE OF A FILLER NECK HOSE HAVING A COMPLEX MULTI-CURVED CONFIGURATION

Melvin C. Badberg, and Roy W. Olsen, both of Lincoln, Nebr. assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 28, 1978, Ser. No. 946,932
Int. Cl.[2] B29C *1/12*
U.S. Cl. 249—183 **4 Claims**



1. A mandrel assembly for forming a filler neck hose into a complex multi-curved configuration and having an internal vent tube vulcanized within its bore comprising:

a metal mandrel for mounting an uncured length of filler neck hose thereon, said mandrel having a complex multi-curved configuration and a groove therein following longitudinally along its length; and

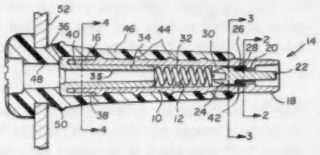
a flexible elastomeric mandrel for mounting an uncured length of vent tubing thereon, said flexible mandrel and vent tubing positioned in the groove such that when the length of filler neck hose is mounted on the metal mandrel and the assembly subjected to vulcanization heat and pressure, the surface of its bore is in intimate contact with the outer surface of the tubing for the substantial length thereof and the filler neck hose and vent tube are integrally joined at their contacting surfaces.

4,171,119

FLUID FLOW VALVE STEM

William C. Lamson, 125 Far Mill St., Huntington, Conn. 06484

Filed Oct. 25, 1977, Ser. No. 844,630
Int. Cl.[2] F16K *1/00*
U.S. Cl. 251—321 **3 Claims**



1. A flow control valve stem for a fluid or the like comprising:

a sleeve having a first passage extending therethrough, a mouth at one end of said sleeve, and an internal annular valve seat on said first passage;

a plunger mounted in said first passage for reciprocal movement and having a free end, an opposite end and a valve seal member interposed therebetween, said plunger further being reciprocally movable by manual movement of said free end between a normal closed position in which said valve seal member engages said annular valve seat to prevent the passage of fluid through said first passage, and an open position in which fluid can pass through said valve seat and said first passage;

an end cap having inner and outer tubular portions defining an annular blind bore for receiving said opposite end of said sleeve in an interference fit for rigidly securing said end cap to the opposite end of said sleeve by a vacuum lock, said end cap further having a second passage extending therethrough in fluid communication with said first passage; and

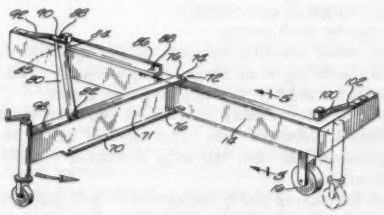
resilient means mounted in said first passage and interposed between said end cap and said plunger for biasing said plunger to said normal closed position.

4,171,120

SCISSORS LIFT WORK PLATFORM

Albert L. Clark, West Bend, Wis., assignor to Pac-Craft Products, Inc., West Bend, Wis.

Division of Ser. No. 805,262, Jun. 10, 1977, Pat. No. 4,114,854.
This application May 25, 1978, Ser. No. 909,740
Int. Cl.[2] B66F *13/00*
U.S. Cl. 254—1 **1 Claim**



1. In a lift device having a base with horizontal frame members and an outrigger the improvement wherein said outrigger is pivotally connected at one end to said base for swinging horizontal movement between a folded position generally parallel to a side edge of said base and an extended operative position transverse to said base and wherein said outrigger has a channel shaped portion which interfits in nesting relation with one of said horizontal frame members when said outrigger is folded to reduce the outline of said lift, a link pivotally connected to said outrigger intermediate its length, a guide track on said base, means on the end of said link adapted to

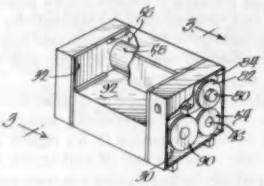
travel in said guide during swinging movement of said outrigger from said folded position to said operative position, spring means on said base associated with said guide track to positively lock said link when said outrigger is swung to its operative position.

4,171,121

STAPLE REMOVING APPARATUS

Robert M. Nitschneider, Cary; John R. Sargis, and Martin Abrams, both of Chicago, all of Ill., assignors to AES Technology Systems, Inc., Elk Grove Village, Ill.

Division of Ser. No. 760,916, Jan. 21, 1977, Pat. No. 4,090,690. This application Apr. 12, 1978, Ser. No. 895,774
Int. Cl.[2] B25C *11/00*
U.S. Cl. 254—28 **3 Claims**



1. Apparatus for disengaging staples in a plurality of documents retained together by a staple comprised of a loop of wire bent and formed with two points driven through the documents and clinched to bind the documents together comprising:

a pair of rotatable force applying members defining a nip therebetween, one of said members being a cylinder affixed to a shaft;

means for rotatably supporting said shaft;

means for rigidly supporting said members in a spaced apart relation with the space between the members being approximately equal to the thickness of the staple wire;

means for rotating said members in opposite directions;

means connecting said rotating means to said shaft for effecting rotation of said cylinder;

non-circular shaft means;

collar means rotatably supported in said apparatus having shaft receiving means shaped complementary to said shaft means for slidably receiving said shaft means;

a roller member slidably received on said shaft means and rotatable therewith, said roller member having an axial dimension less than the axial dimension of said shaft means;

means for locking said roller member to said shaft means at a selected axial position, said locking means including an axial extension formed at one end of said roller member having a diameter less than the diameter of said roller member, and means in said extension for locking said roller member to said shaft;

the opposite end of said roller member from said extension being formed with an axial recess adapted to slidably receive an extension on an adjacent roller member;

whereby a stapled document introduced into the nip between said rotatable members is pulled therethrough and said staple is displaced through said documents to sever itself from said documents.

4,171,122

TENSIBLE REINFORCEMENT BAR FOR SHIPPING CONTAINERS

Charles Munsch, Bronx, and John M. DiMartino, Sayville, both of N.Y., assignors to Line Fast Corporation, Holbrook, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,426
Int. Cl.[2] B66F *3/08*
U.S. Cl. 254—67 **13 Claims**

1. A tensible shipping container reinforcement bar capable of reinforcing the faces of an I.S.O. Type Standard Shipping Container when attached thereto, said container having corner fitting at each of the corners thereof, each said fitting having orifices on each of the external faces thereof, said orifices being surrounded by a wall surface and said orifices opening into a recess therebeing, said bar comprising:

a first bar having a first end and a second end;

a first connector means mounted on the first end of said first bar capable of removeable engagement with the wall surrounding the orifice of an upper corner fitting of said container;

a second connector means mounted on the second end of said first bar capable of removeable engagement with the wall surrounding the orifice of a lower corner fitting of said container;

tensioning means mounted on said first bar at a point which is intermediate to the first and second connector means mounted on said first bar is mounted across the face of a side of a container having the first connector in engagement with an upper corner fitting of the container and the second connector in engagement with a lower corner fitting of the container;

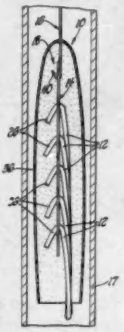
said bar being adapted to being mounted diagonally across the face of the container and when so mounted extends less than one and one half inches from the face of the container upon which it is mounted;

cross over means on said bar adapted to permit a second bar similarly constructed as said first bar capable of being mounted on said container face cross-wise with respect to said first bar, said first bar and said second bar are so configured that the thickness of both said bars at the point of crossover extends less than one and one half inches from the surface of the container upon which they are mounted.

4,171,123
CONDUCTOR PULLING DEVICE

Virgil N. Woelkers, 8695 Oakside Dr., Union Lake, Mich. 48085

Filed May 11, 1978, Ser. No. 904,923
Int. Cl.[2] F21C *29/16*
U.S. Cl. 254—134.3 FT 18 Claims

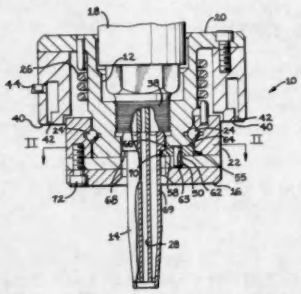


1. A conductor pulling device comprising; a pulling member having opposed flat faces and a plurality of spaced openings therealong and extending between said opposite faces for independently receiving a plurality of conductors, said opposed faces being smooth and devoid of any projections, connection means for connecting said pulling member to a pulling means whereby said pulling member and the conductors received thereby may be pulled through a conduit, retaining means associated with each of said openings for individually and independently detachably retaining the respective conductors to said pulling member to allow the conductors to be pulled through a conduit with the conductors being individually retained to said pulling member at spaced positions along said pulling member, all of said spaced openings being identical in configuration with all of said openings and associated retaining means being oriented identically relative to said connection means.

4,171,124
FLAME CUTTING TIP AND TORCH HOLDER

James A. Coulter, Geneseo, Ill., and Roland E. Hasselbacher, Bettendorf, Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 12, 1978, Ser. No. 923,877
Int. Cl.[2] B23K *7/00*
U.S. Cl. 266—48 24 Claims



1. A holder comprising:

a body (10) with a linearly extending bore (12) therethrough, said bore being adapted for receiving a first member (14) from a first end (16) of said body (10) and a second member (18) from a second end (20) of said body (10);

an actuating member (22) rotatably mounted to the body (10);

means (26) for biasing the actuating member (22) into a first rotational position relative said body (10), said actuating member (22) being rotatable into a second rotational position by exerting a force thereto to overcome said biasing means (26);

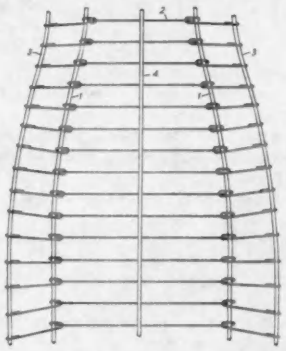
clamping means (55) normally engaging said first member (14) for holding said first member (14) in a fixed position relative to said second member (18) when said actuating member (22) is maintained in its first rotational position; and

cam means (48) responsive to rotation of said actuating member (22) to its second rotational position for releasing said clamping means (55) from said first member (14) for permitting removal of said first member (14) from said holder.

4,171,125
SPRING PANEL FOR SEAT CUSHION SUPPORT STRUCTURE

David T. Griffiths, Ammanford, Wales, assignor to Youngflex S.A., Fribourg, Switzerland

Filed Mar. 3, 1978, Ser. No. 883,191
Claims priority, application United Kingdom, Apr. 4, 1977, 14192/77; Jul. 19, 1977, 30343/77
Int. Cl.[2] F16F *3/02*
U.S. Cl. 267—102 3 Claims



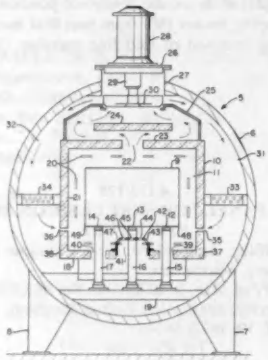
1. A cushion support structure for incorporation in a seat, comprising two spaced longitudinally extending cord members, a plurality of spring metal wires extending transversely between said longitudinal cord members and connected to the latter, said transverse wires spaced apart from one another in the longitudinal direction of said cord members, said transverse wires extending outwardly beyond at least one said longitudinal cord member at an acute angle to the axis of the portions of said transverse wires intermediate said cord members, and at least one longitudinally extending edge cord interconnecting the free ends of said outwardly extending transverse wires, the said transverse wires having, between said intermediate portions and said outwardly extending portions, portions looped around said at least one cord member to connect with the latter, and portions extending across the said intermediate portions, in a direction substantially parallel to said at least one longitudinal cord member and adjacent said at least one longitudinal cord member whereby said looped portions are interlocked against unwinding under outward tension placed upon said at least one longitudinal cord member.

4,171,126

VACUUM FURNACE WITH COOLING MEANS

Frederick E. Zahn, Toledo, Ohio; David L. Checkley, Blissfield, Mich., and Wallace J. Titus, Toledo, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Mar. 13, 1978, Ser. No. 885,630
Int. Cl.[2] C21D *1/66, 1/74*
U.S. Cl. 266—250 **13 Claims**



1. A vacuum furnace, comprising:

(a) a generally hollow shell sealable from the ambient atmosphere;

(b) a casing disposed within the surrounding shell and spaced therefrom, the casing defining a heat treatment chamber within the furnace;

(c) means for supporting within the chamber, a workpiece to be heat treated including:

(I) a plurality of elongated rails which support the workpiece and extend longitudinally of the chamber; and

(II) a plurality of posts supporting each of the rails and extending through the casing;

(d) means disposed within the chamber for heating a workpiece disposed therein;

(e) a sufficient number of adequately sized inlet openings strategically located in the vertically lower half of the casing for directing cooled gas at relatively low velocities not exceeding 3,000 fpm into the chamber, the openings being the only means for directing gas into the chamber and including an annular opening in the casing around each of the posts;

(f) at least one large exhaust outlet, as compared to the size of an inlet opening, disposed in the vertically uppermost portion of the casing through which gas exits the chamber, any of such outlets being sized so as not to adversely affect the flow of gas vertically upwardly through the chamber;

(g) means disposed interiorly of the furnace for cooling gas circulated between the exhaust outlet and inlet openings; and

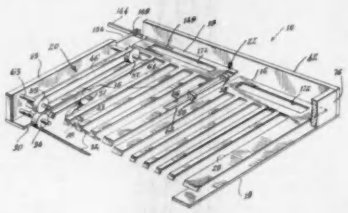
(h) a fan, including an impeller located interiorly of the furnace, for circulating gas from the chamber through the exhaust outlet, then through the cooling means and then through the many inlet openings into the chamber at velocities not exceeding 3,000 fpm.

4,171,127

APPARATUS FOR COLLATING PAGES OF MULTI-UP PRINTED DOCUMENTS

Richard E. Kish, Fairfield, and Andrew W. Rastorguyeff, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,627
Int. Cl.[2] B65H *39/04*
U.S. Cl. 270—58 **25 Claims**



1. An apparatus for collating pages of a document initially arranged sequentially on a continuous sheet in multipage rows, said apparatus comprising:

A. a plurality of decks, at least equal in number to the number of pages in each row on the sheet, each having a surface for receiving one document page, said decks being movable from relatively elevated positions in which each deck surface is positioned at a level above one deck surface adjacent thereto thereby defining a step-like structure and coplanar positions in which said deck surfaces are in coplanar relation;

B. means for moving said decks between the elevated and the coplanar positions;

C. longitudinal delivery means for simultaneously delivering each of the pages in a single multipage row to a single deck; and

D. lateral transfer means for transferring the page delivered to each deck to the top of the page delivered to the adjacent lower deck.

25. An apparatus for collating pages of a document sequentially arranged on a continuous sheet in multi-page rows, said apparatus comprising:

A. a plurality of decks, equal in number to the number of pages in each row on the sheet, each having a surface for receiving one document page, said decks being movable from relatively elevated positions in which each deck surface is positioned at a level above one deck surface adjacent thereto thereby defining a step-like structure to coplanar positions in which said deck surfaces are in coplanar relation;

B. means for moving said decks between the elevated and the coplanar positions;

C. slitting means for separating adjacent pages in a multipage row on the sheet;

D. cutting means for separating adjacent multi-page rows on the sheet;

E. longitudinal delivery means for simultaneously delivering each of the separated pages in a single multi-page row to a single deck; and

F. lateral transfer means for transferring the page delivered to each deck to the top of the page delivered to the adjacent lower deck.

4,171,128

DOCUMENT FEEDER FOR A COPIER

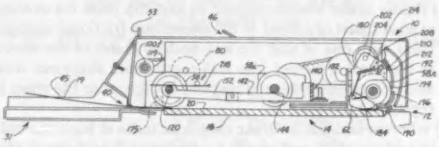
Robert Irvine, Riverside, and Harry E. Luperti, Wilton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,613
Int. Cl.[2] B65H *5/22*
U.S. Cl. 271—3 **6 Claims**

1. A document feeder adapted for use with a copier having

a document illuminating station, a platen at the illuminating station and means for flash illuminating respective documents on the platen, the document feeder comprising:

(a) first document feeding means for rearwardly feeding respective documents to the platen, said first document feeding means including a rotatable drive shaft and at least one roller mounted thereon for rotation therewith, said drive shaft mounted for forward translation of said at least one roller into document feeding engagement with respective documents, means for forwardly translating said drive shaft and thereby said at least one roller in response to



respective documents being rearwardly fed into document feeding relationship with said at least one roller, and said drive shaft mounted for elevation of said at least one roller to accommodate respective documents of different thickness;

(b) second document feeding means for feeding respective documents from the illuminating station after illumination thereof; and

(c) third document feeding means cooperative with the first document feeding means for feeding respective documents to the platen.

4,171,129

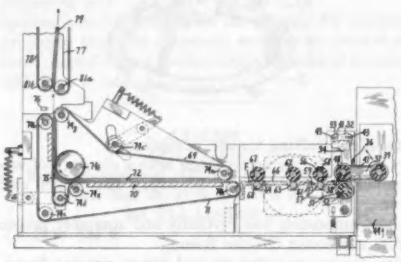
DOCUMENT TRANSPORT

William C. Daley, West Hartford; Andrew Hall, South Winsor, and Arthur M. Sikes, Suffield, all of Conn., assignors to Scan-Optics, Inc., East Hartford, Conn.

Filed Jun. 24, 1977, Ser. No. 809,692

Int. Cl.² B65H 5/22

U.S. Cl. 271—6 **14 Claims**



1. Apparatus for successively transporting center registered documents one at a time from a first stack of documents to a second stack, comprising:

elevator means for lifting said first stack of documents to a feeding position;

extracting means for successively extracting the topmost document from the first stack when it is in the feeding position, said extracting means including a rotatable alignment member having a surface area engageable with the center axis and of the document, the area of contact between said rotatable alignment member and the document being such that the document can swivel upon extraction from the stack with the area of contact as the pivot point;

a document orienting means for aligning the center registered documents including a movable wall member responsive to the movement of a document from said first stack so as to be positioned to intercept the document in such a manner that the leading edge of the document engages the wall member, the position of said wall member being such that the document is simultaneously engaged by the wall member and by the rotatable alignment member of the document extracting means, whereby the document is aligned parallel to the wall member by being driven against it by said rotatable alignment member; and

a moving conveyor for transporting aligned documents to said second stack.

4,171,130

CONTROL OF WITHDRAWAL OF FLAT ITEMS INDIVIDUALLY FROM A STACK

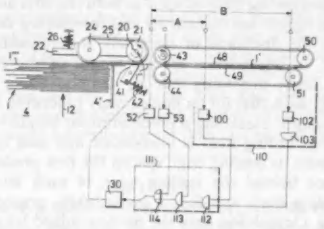
Henning Jeschke, Constance, and Winfried Bruchmann, Reinheim, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,849

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758007

Int. Cl.² B65H 3/02, 7/02

U.S. Cl. 271—10 **10 Claims**



1. In a procedure for discharging items whose lengths vary over a given range in succession from a stack and conveying the items, after discharge, along a conveying path with each item being oriented such that its length is parallel to the direction of conveyance and with each item on the conveying path being spaced from the next succeeding item subsequently discharged from the stack, the improvement comprising automatically controlling the discharge of each item in dependence on the length of the respective immediately preceding item on the conveying path in a manner such that for an immediately preceding item having a length exceeding a predetermined length value, the next succeeding item is introduced into the conveying path with its leading edge a first predetermined distance behind the trailing edge of such immediately preceding item, and for an immediately preceding item having a length less than the predetermined length value, the next succeeding item is introduced into the conveying path with its leading edge a second predetermined distance behind the leading edge of such immediately preceding item.

2. In a system for discharging items whose lengths vary over a given range in succession from a stack and conveying the items, after discharge, along a conveying path with each item being oriented such that its length is parallel to the direction of conveyance and with each item on the conveying path being spaced from the next succeeding item subsequently discharged from the stack, which system includes a pair of continuously driven conveying rollers which are arranged downstream of the stack and form the entrance of the conveying path, a controllable withdrawal device disposed between the conveying path and the stack and arranged to discharge each item in succession from the stack and operative in response to a control signal to advance each such item into the effective range of the conveying rollers, a monitoring device arranged to emit signals in dependence on the passage of the leading or trailing edge of an item past a point along the conveying path, and a control circuit arranged to produce the control signal for the withdrawal device in dependence on the signals from the

monitoring device when the distance of the leading or trailing edge of the respective item from the leading edge of the next succeeding item present in the effective range of the withdrawal device has exceeded a given value, the improvement wherein:

said monitoring device comprises means for emitting a first output signal when the distance of the trailing edge of the item on said conveying path from the leading edge of the next succeeding item present in the effective range of said withdrawal device has exceeded a first predetermined distance, and means for emitting a second output signal when the distance of the leading edge of the item on said conveying path from the leading edge of the next succeeding item present in the effective range of said withdrawal device has exceeded a second predetermined distance;

said means for emitting are arranged such that the difference between said first and second distances is greater than the length of an item whose length is in the lower portion of the given range of lengths and less than the length of an item whose length is in the upper portion of the given range of lengths; and

said control circuit includes means for emitting a control signal to actuate said withdrawal device for advancing the next succeeding item as soon as both the first and second output signals are emitted by said monitoring device;

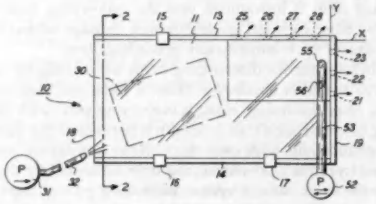
whereby the discharge of each item is automatically controlled in dependence on the length of the respective immediately preceding item on said conveying path in a manner such that for an immediately preceding item having a length exceeding a predetermined length value, the next succeeding item is introduced into said conveying path with its leading edge spaced the first predetermined distance behind the trailing edge of such immediately preceding item, and for an immediately preceding item having a length less than the predetermined length value, the next succeeding item is introduced into said conveying path with its leading edge spaced the second predetermined distance behind the leading edge of such immediately preceding item.

4,171,131

PNEUMATIC REGISTRATION APPARATUS

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 627,642, Oct. 31, 1975, abandoned.
This application Dec. 12, 1977, Ser. No. 860,009
The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.
Int. Cl.[2] B65H *9/00*
U.S. Cl. 271—236 **1 Claim**



1. Apparatus for fluidicly registering a flimsy sheet such as thin paper with respect to perpendicularly related axes for copying, the sheet having a length and width within predetermined ranges, comprising:

(a) a sleeve larger than the sheet for internally accommodating said sheet, at least one registration point on an inner narrow wall of the sleeve being coincident with one of the axes;

(b) a registration stop located adjacent one end of the sleeve, the stop having at least one point coincident with the other of the axes;

(c) wherein said sleeve includes a top plate and a spaced apart bottom plate with at least said bottom plate being transparent and providing an unobstructed copying area for a sheet registered in said sleeve;

(d) means for providing in the sleeve a fluid stream, including at least a port in said stop and at least a port in said narrow wall to cause said fluid stream to have velocity components normal to each of said axes, whereby when a sheet is placed in the sleeve the stream moves the sheet into abutment with each of said points; and

(e) fluidic brake means coupled to said top plate for driving at least a part of a sheet in the sleeve into frictional engagement with one of said top and bottom plates of the sleeve as the sheet is moved into said registration abutment with said points, thereby reducing impact forces as the sheet is registered;

(f) wherein said fluidic brake means includes at least one hole in said top plate, and means for pumping fluid through said at least one hole to provide jets of air forcing the sheet into frictional engagement with one of said top and bottom plates as the sheet moves into said registration;

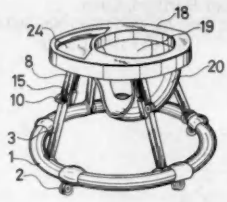
whereby the sheet may be copied from said transparent bottom plate side, which is not coupled to said fluidic brake means.

4,171,132

INFANT WALKING TRAINER

Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1977, Ser. No. 862,056
Claims priority, application Japan, Jan. 14, 1977, 52/3593[U]
Int. Cl.[2] A47D *13/04*
U.S. Cl. 272—70.3 **3 Claims**



1. An infant walking trainer, comprising:

a lower circular frame provided with a plurality of wheels;

an upper circular frame confronting said lower circular frame;

a lower supporting rod pivotally and rotatably projecting from said lower circular frame;

a first stopper provided on said lower circular frame and contacting the outer side of said lower supporting rod when in the engaged state, for limiting outward rotation of said lower supporting rod;

an upper supporting rod pivotally and rotatably depending from said upper circular frame;

a second stopper provided in the internal surface of said upper circular frame and contacting the outer side of said upper supporting rod when in the engaged state, for limiting outward rotation of said upper supporting rod;

a connecting means connecting the upper end of said lower supporting rod and the lower end of said upper supporting rod rotatably with each other;

at least one lower and one upper engaging groove and a lower and an upper engaging portion which are provided on the upper end of said lower supporting rod and on the lower end of said upper supporting rod, respectively;

an engaging means for fixing said lower and upper supporting rods collinearly by engaging both said lower and

upper engaging portions when in the engaged state, said engaging means being slidable with said lower and upper engaging grooves; and

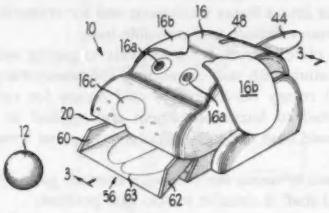
an engaged state maintaining means for maintaining the engaged state of said engaging means.

4,171,133

SELF-PROPELLED TARGET TOY

Howard J. Morrison, Deerfield, and Palmer J. Schoenfield, Evanston, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,402
Int. Cl.[2] A63B *71/02*
U.S. Cl. 273—127 C **9 Claims**



9. A self-propelled target toy for capturing a projectile and returning the projectile, comprising:

a housing formed generally in the shape of an animal;

drive means on the housing for propelling the target toy over a suitable supporting surface, said drive means including a spring motor and crank means connected thereto for manually winding said spring motor, said crank corresponding to a simulated tail for the animal;

projectile receiving means defined on said housing for actuating said drive means in response to receipt of a projectile, said projectile receiving means comprising a projectile capturing member pivotally mounted on the housing for movement from a preset projectile receiving position to an actuating position in response to the weight of the projectile; and

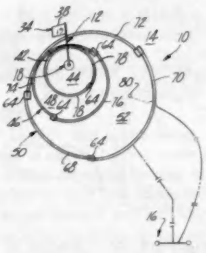
propelling means mounted on the housing for ejecting the projectile from the capturing member by pivotal movement thereof after a predetermined period of actuation of said drive means.

4,171,134

GOLF GAME

Ray G. Reck, 16 Parakeet Hill, Pontiac, Mich. 48055

Filed Jun. 29, 1978, Ser. No. 920,240
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—181 R **6 Claims**



1. A golf game apparatus for use on a natural ground surface comprising:

a golf flag assembly insertable into the ground surface;

a first annulus positioned on said ground surface around said golf flag assembly and defining a first target area within its inner periphery;

a second annulus having a diameter larger than the diameter of the first annulus, said second annulus being positioned on said ground surface around said first annulus and defining a second target area between said first annulus and said second annulus;

a third annulus having a diameter larger than the diameter of the second annulus, said third annulus being positioned on said ground surface around said second annulus and defining a third target area between said third and said second annulus;

wherein each annulus comprises at least one elongated tubular cylindrical member, the ends of said tubular cylindrical member being brought together in an end to end relationship, and means for detachably joining the ends of the tubular cylindrical member together, wherein said last mentioned means comprises a double C-shaped clamp adapted to resiliently engage the outer periphery of the tubular cylindrical member;

a substantially hollow and perforated golf practice ball;

wherein said perforated ball is hit with a standard golf club toward the golfing assembly; and

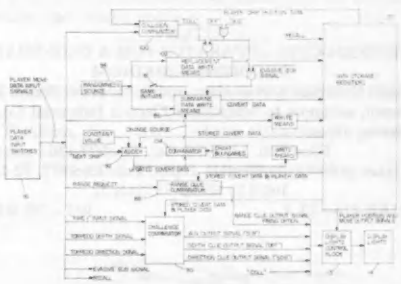
wherein a player's score is determined by the number of strokes necessary to hit said practice ball into either said first, second or third target areas plus a predetermined number of strokes for the target area into which the practice ball lands, said predetermined number of strokes being larger for said second target area than said first target area, and said predetermined number of strokes for said third target area being larger than said second target area.

4,171,135

CHANCE BASED SUBMARINE HUNTING GAME

Holly T. Doyle; Robert O. Doyle, both of 77 Huron Ave., Cambridge, Mass. 02138, and Wendl Thomis, 55 Dinsmore Ave., Framingham, Mass. 01701

Filed Feb. 14, 1978, Ser. No. 877,766
Int. Cl.[2] A63F *9/02*
U.S. Cl. 273—237 **12 Claims**



1. Apparatus for a submarine hunting board game playable by at least one player, comprising

a control and display console having

player actuated game initiate means providing a game initiate signal,

numerical and directional display light means,

player actuated player data input switches for input of player move signals comprising a player turn initiate signal, a range clue request signal, signals representing player ship course and speed data indicating a move of player's ship to a subsequent player ship positions, signals representing torpedo aim data, and a torpedo fire signal,

said game apparatus further comprising

a randomness source,

data storage registers for storing player ship data and submarine data, said player data input switches being

connected thereto for writing data into said storage registers,

display lights control means connected to said display light means for control thereof, and connected to said data storage registers for output of data stored therein for display on said display light means,

submarine data write means responsive to said game initiate signal and to said randomness source for writing into said data storage registers initial covert submarine data representing initial submarine position

adder means responsive to said input player move signals and to said stored covert submarine data for updating said covert submarine position data by a constant increment and for storing said updated covert submarine data in said data storage registers,

range clue comparator means responsive to stored said input player move signals and to said stored covert submarine data and stored player data for providing a range clue output signal representative of distance between said player ship position and said submarine covert position,

said display lights control means being responsive to a said range clue output signal representive of a particular minimum distance to control said display light means to indicate an option to input said torpedo aim data signals and torpedo fire signal,

said game apparatus further having challenge comparator means responsive to said stored covert data and player data and to the input of said torpedo aim data signals for providing one of a plurality of challenge outcome signals comprising

a clue output signal representing a non-correspondence between said torpedo aim data and said stored updated submarine covert data, and

a win output signal representing correspondence between said input torpedo aim data and said stored updated submarine covert data,

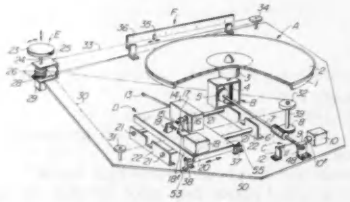
said challenge comparator means outputting said one challenge outcome signal to said display lights control block to control said display light means for display representing said signal.

4,171,136

REPRODUCING APPARATUS FOR A DISK-SHAPED RECORDING MEDIUM

Tadashi Nagaoka, Nishinomiya, and Izumi Hino, Daito, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 13, 1978, Ser. No. 877,476
Claims priority, application Japan, Feb. 15, 1977, 52-15649
Int. Cl.[2] G11B *3/10, 5/52*
U.S. Cl. 274—23 A **5 Claims**



1. A reproducing apparatus for a disk-shaped recording medium, comprising:

means for rotating a disc-shaped recording medium;

a base horizontally movable in a plane parallel to said disk-shaped recording medium;

means carried by said movable base for detecting recording signals from said disk-shaped recording medium;

means for selectively causing said detecting means to engage with and disengage from said disk-shaped recording medium;

a control shaft having a control knob attached at one end thereof, said control shaft being rotatable and axially movable in association with corresponding rotating and axial movements of said control knob;

means for causing said control shaft to become selectively situated in one of a first and second axial positions upon axial movement of said control knob;

a first clutch means including a drive member and a driven member, said drive member being rotated with the rotation of said control shaft by rotation of said control knob and coupled with said driven member when said control shaft member is situated in said second position;

means for converting the rotatory movement of said driven member into a linear movement and for transmitting the linear movement to said movable base;

a second clutch means for selectively engaging said means for rotating with said converting and transmitting means so that rotary movement of said means for rotating is converted to linear movement and applied to linearly move said base through said converting and transmitting means;

a first switch means for closing a contact path when said control shaft is situated in said first position;

a first electrical circuit, established through the closed contact path of said first switch means, for actuating said engaging and disengaging means to engage said detecting means with said disc-shaped recording medium; and,

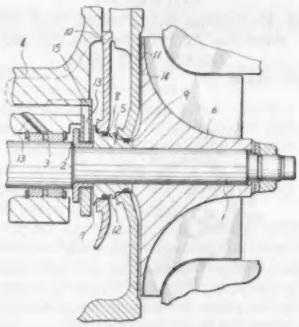
a second electrical circuit, established through the closed contact path of said first switch means for actuating said second clutch means so as to engage said means for rotating with said converting and transmitting means.

4,171,137

SLINGER ARRANGEMENT FOR USE WITH BEARING OF SUPERCHARGER

Shoichi Aizu, Sakura, and Masami Shimizu, Chiba, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1978, Ser. No. 904,893
Claims priority, application Japan, Jun. 1, 1977, 52-71165[U]
Int. Cl.[2] F16J *15/42;* **F01D** *11/02*
U.S. Cl. 277—25 **6 Claims**



1. A slinger arrangement for a bearing of a supercharger wherein a slinger which is mounted on a turbine shaft has a large-diameter portion and a small-diameter portion, and seal rings are fitted over said large- or small-diameter portion and made into contact with an air vent chamber casing and an air vent chamber backplate.

4,171,138
SKI BRAKE

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

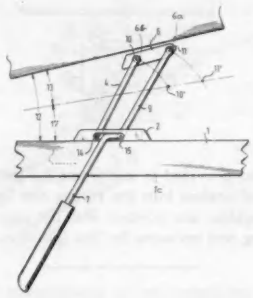
Continuation of Ser. No. 697,614, Jun. 18, 1976, Pat. No. 4,087,113, which is a continuation-in-part of Ser. No. 557,476, Mar. 12, 1975, Pat. No. 3,989,271. This application Mar. 10, 1978, Ser. No. 885,183

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1974, 2412623; Jul. 26, 1974, 2436155; Feb. 20, 1975, 2507371

The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.

Int. Cl.[2] A63C *7/10*

U.S. Cl. 280—605 3 Claims



1. A brake for a ski automatically operable to prevent free flight thereof upon the release of the ski from a skiboot, said brake comprising:

a support on the upper surface of said ski having a passage;

an actuator comprising first and second bent spring wires engaged in said passage and swingable on said support about respective spaced axes, said spring wires forming a force-storing means tending to swing said actuator into an upstanding position on said support from a rest position by subjecting said first spring wire to greater elastic deformation in said rest position than in said upstanding position, said wires being generally coplanar in one of said positions;

a brake element on one of said spring wires extending transversely to the ski in said upstanding position of said actuator and downwardly into snow underneath said ski, said actuator being displaceable into a position lying along said surface and wherein said element is swung out of its transverse position and said wires into said rest position; and

a tread plate connecting said spring wires at spaced pivotal locations and displaceable by said ski boot to press said actuator toward said surface.

4,171,139
COLLAPSIBLE PACK CART

Edwin F. Cockram, 606 NW. 99th, Vancouver, Wash. 98665

Continuation of Ser. No. 733,368, Oct. 18, 1976, abandoned. This application May 8, 1978, Ser. No. 903,715

Int. Cl.[2] B62B *11/00*

U.S. Cl. 280—652 7 Claims

1. A collapsible pack cart comprising:

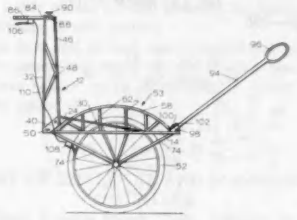
(a) a first frame member, having inner and outer sides;

(b) a second frame member, having inner and outer sides, pivotally joined to said first frame member along adjacent transverse edges thereof, and movable with respect to said first frame member between an operating position wherein said frame members are oriented substantially perpendicular to each other, and a folded position wherein said frame members are positioned adjacent to one another with their respective inner sides facing one another, and separated by a space distance;

(c) spaced apart, paired wheel supports extending longitudinally medially across said second frame member defining a medial wheel receiving opening therebetween;

(d) a wheel, and a carriage rotatably mounting said wheel, said carriage arranged to freely fit within said medial wheel receiving opening in an operated position such that the wheel partially extends therefrom substantially perpendicular to the plane of both said frame members when they are in their operating position;

(e) said carriage having paired sides, which are substantially coextensive with said wheel supports and spaced apart so as to lie inwardly adjacent the respective wheel supports when said carriage is in its operative position, and paired ends interconnecting the extremities of said sides;



(f) locating tabs mounted on said second frame member at spaced intervals about the periphery of said wheel receiving opening, said tabs being positioned in a manner to engage each of said sides and said ends of said carriage when it is in its operative position so as to prevent it from being displaced further toward the inner side of said second frame member;

(g) locking means associated with said second frame member and said carriage for securing said carriage in its operative position; and

(h) retention means associated with said first frame member and said carriage for releasable attachment of said carriage to said first frame member in a storable position so that it is located entirely between said frame members when they are in their folded position.

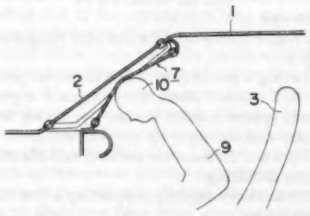
4,171,140
AUTOMOTIVE SAFEGUARD FOR PROTECTING OCCUPANTS

Suga Toshihisa, No. 13-18, 2-chome,Naka-cho, Urawara-shi, Saitama-ken, Japan

Filed Oct. 27, 1977, Ser. No. 845,940

Int. Cl.[2] B60R *21/02*

U.S. Cl. 280—749 4 Claims



1. In a vehicle having a front windshield, a front dashboard below the windshield, and a front seat to the rear of the windshield, the improvement comprising an occupant safety shield comprising a shock absorbing protection plate, mounting means mounting said protection plate so that it is positioned between the front seat and the windshield and overlies the entire windshield and defines an air space above the dashboard between said plate and said windshield, said protection plate

comprising an intermediate transparent impact absorbing stretchable film cushioning element, and a reinforced safety glass plate on the side of said film facing the seat being constructed to withstand stress but being breakable if stressed beyond its stressing point into fine glass pieces so as to minimize exposure of the occupant to large size glass pieces which might produce a fatal injury, said glass plate and said film together defining a cushioning element for the occupant.

4,171,141

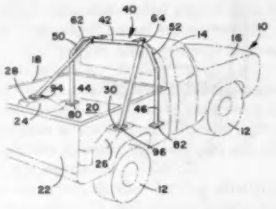
VEHICLE REINFORCING BAR

Alvin J. Hobrecht, 6521 Crista Palma Dr., Huntington Beach, Calif. 92647

Filed Dec. 9, 1977, Ser. No. 859,050

Int. Cl.[2] B60R *27/00*

U.S. Cl. 280—756 **9 Claims**



1. The combination of a vehicle and a reinforcing support comprising:

a vehicle having a cab area for occupants with a bed therebehind upon which a reinforcing member can be mounted;

a U shaped member having a cross member and uprights with mounting means attached thereto adapted to be mounted to the bed of said vehicle; and

at least two reinforcing angular members attached to said cross member of said U shaped member by sleeves mounted on said cross member in circumferential relationship thereto with mounting means at the other end adapted to be mounted to a portion of the structure of said vehicle for purposes of holding said angular member to said structure whereby the brace said U shaped member so that upon an impact or a roll, the cross member will serve to receive the load that would normally be spread across the cab of said vehicle.

4,171,142

LEAK REPAIR CLAMP

George W. Harrison, Alvin, Tex., assignor to Team, Inc., Alvin, Tex.

Continuation-in-part of Ser. No. 682,485, May 3, 1976, Pat. No. 4,049,296. This application Sep. 12, 1977, Ser. No. 832,112

Int. Cl.[2] F16L *55/16*

U.S. Cl. 285—10 **11 Claims**

1. A leak repair clamp for pipe and pipe flanges and the like, comprising:

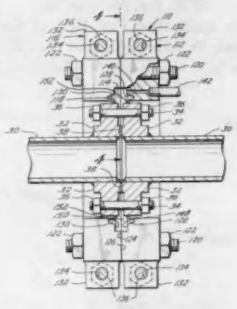
a frame having a plurality of frame segments positionable in end-to-end relation about the pipe, each segment having integrally spaced parallel annular lips flaring from its inner periphery and having a tip portion bent over in order to extend toward the other tip portion, said plurality of frame segments including:

(i) a first section integrally supporting a first of the spaced parallel lips,

(ii) a second section integrally supporting a second of the spaced parallel lips, and

(iii) means for connecting the first section to the second section to thereby make each frame segment with spaced parallel annular lips; means for connecting the frame segments to one another

when positioned in end-to-end relation, the spaced lips extending from said frame segments to form an annular recess around the pipe when the pipe segments are connected, said segment connecting means including a flange on each end of each segment for disposal adjacent the flange of an adjacent segment, the end faces of said segments being brought into sealing engagement with one another when the frame segments are connected; and



access means provided in said frame for permitting passage of a liquid sealant into the recess, the lips directing the flow of sealant into contact with the pipe to form a self-energizing seal between the lips and pipe.

4,171,143

BUMPER FOR A MOTOR VEHICLE

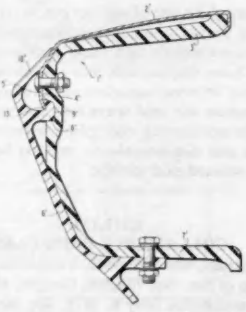
Guntram Huber, Aidlingen; Hubert Hutai, Grafenau; Wolfgang Klie, Korntal; Wolfgang Fischer, Echterdingen; Reinhold Heim, Boblingen, and Wolfgang Labatze, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,933

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650009

Int. Cl.[2] B60R *19/02*

U.S. Cl. 293—121 **29 Claims**



1. A bumper for a motor vehicle or the like which exhibits a vehicle width in a direction transverse to the vehicle travel direction, comprising:

support means extending substantially across the vehicle width and supported at fixed vehicle parts, said support means exhibiting an outwardly facing end face which faces away from the fixed vehicle parts,

a decorative cover extending over an upper surface of said support means, said cover extending to and downwardly over only an upper portion of said end face, said cover terminating in the downward direction at a position spaced from the bottom of said support means,

covering means adjoining the cover and covering the area of said end face below said cover,

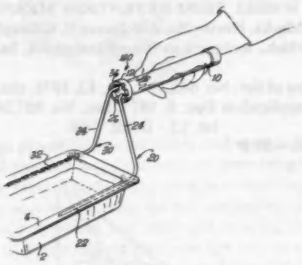
and fastening means for fastening the cover and covering means to said support means, said covering means and cover being configured to completely cover said fastening means and said end face of the support means so that only said covering means and cover are visible in the direction facing said end face.

4,171,144

HOT-TRAY MANIPULATING DEVICE

Roberto Rodriguez, 612 Meridian Ave., Alhambra, Calif. 91801

Filed Dec. 5, 1977, Ser. No. 857,311
Int. Cl.[2] A47J *45/10*
U.S. Cl. 294—30 **6 Claims**



1. A hot tray manipulating device, comprising:

handle means,

a pair of lifting tines, each of said tines comprising a root segment, a cranked portion substantially orthogonal to said root segment, and a forward segment substantially parallel to said root segments,

socket means for retaining said root segments of said pair of tines rotatably mounted in said handle means with said segments in parallel relation and said cranked portions in angularly displaced relation, and

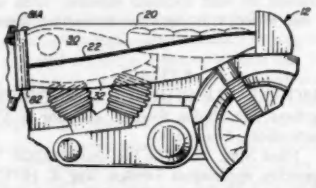
adjusting means comprising plural retaining means on the handle means for selective engagement with the tines to provide selected angular displacement between said tines.

4,171,145

RETRACTABLE SEAT COVER APPARATUS FOR MOTORCYCLES

Roger W. Pearson, Sr., Phoenix, Ariz.

Filed May 30, 1978, Ser. No. 910,443
Int. Cl.[2] B60J *7/20*
U.S. Cl. 296—78.1 **10 Claims**



1. A retractable protective covering apparatus for attachment to a motorcycle for covering the seat and fuel tank of the motorcycle, said apparatus comprising in combination:

(a) a housing;

(b) a spring loaded spool mounted in said housing;

(c) a protective cover formed of flexible waterproof material, said protective cover being extendable to cover the tank and the seat of the motorcycle, said protective cover being wound around said spring loaded spool, said protective cover including

i. a top panel, having a width approximately equal to the length of said spring loaded spool;

ii. first and second flexible upper side panels each having an inside edge attached to a respective inside edge of said top panel;

iii. first and second flexible lower side panels hingeably connected to said first and second upper side panels, respectively;

iv. first and second flexible hinge strips connecting said first and second upper side panels, respectively, to said first and second lower side panels; and

(d) fastening means attached to an extendable end edge of said protective cover for maintaining said protective cover in an extended configuration over the tank and seat of the motorcycle;

(e) sloted guide means on said housing for facilitating automatic folding of said panels;

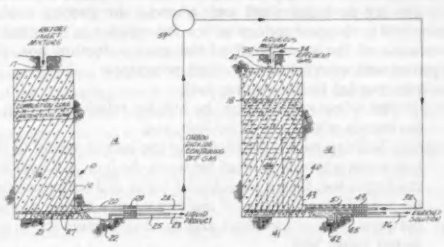
whereby said first and second upper panels and said first and second lower panels fold easily toward said top panel to permit said protective cover to be conveniently rolled upon said spring loaded spool.

4,171,146

RECOVERY OF SHALE OIL AND MAGNESIA FROM OIL SHALE

Robert A. Hard, Laguna Beach, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Jan. 23, 1978, Ser. No. 871,367
Int. Cl.[2] E21B *43/28;* **E21C** *41/10*
U.S. Cl. 299—2 **71 Claims**



1. A method for recovering shale oil and leaching magnesium values from formation particles in an in situ oil shale retort in a subterranean formation containing oil shale and magnesium values which comprises:

advancing a combustion zone through a fragmented permeable mass of formation particles containing oil shale and magnesium values in an in situ oil shale retort by introducing an oxygen containing gas to the fragmented mass on the trailing side of the combustion zone and withdrawing an off gas from the fragmented mass on the advancing side of the combustion zone, whereby gas flowing through the combustion zone transfers heat of combustion to a retorting zone in the fragmented mass on the advancing side of the combustion zone and wherein kerogen in oil shale in the retorting zone is decomposed to produce gaseous and liquid products including shale oil and carbonaceous residue, such carbonaceous residue supporting combustion in the combustion zone at sufficient temperatures for converting oil shale to a form from which magnesium values can be selectively leached;

selectively leaching magnesium values from at least a portion of the fragmented mass by contacting particles in the fragmented mass with an acidic aqueous leaching agent containing dissolved purgeable acid-forming gas for forming enriched solution containing magnesium values;

withdrawing enriched solution containing magnesium values from the retort; and

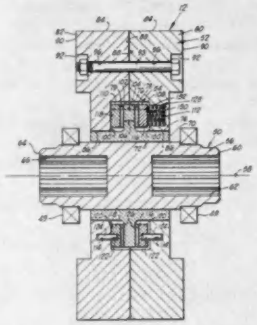
recovering magnesium values from such enriched solution.

4,171,147

FLYWHEEL FOR A CONSTRUCTION MACHINE

George W. Swisher, Jr., Oklahoma City; Donald W. Smith, Edmond, and John F. Phillips, Yukon, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Jun. 12, 1978, Ser. No. 915,071
Int. Cl.[2] E21C 47/00
U.S. Cl. 299—39 2 Claims



1. In a construction machine having a rotationally driven cutting tool, a drive train coupled to the cutting tool for rotating the cutting tool, and a flywheel coupled to the cutting tool for rotation about a flywheel axis upon rotation of the cutting tool, wherein the drive train is characterized as including a hydraulic motor, having an output shaft, and a gear reduction box, having an input shaft and wherein the cutting tool is connected to the gear reduction box for rotation in response to a rotation of the input shaft of the gear reduction box, the improvement wherein the flywheel comprises:

a hub coupled to the cutting tool;

an inertia wheel mounted on the hub for relative rotation of the inertia wheel about the hub; and

torque limiting means for clamping the inertia wheel to the hub when a torque exerted between the inertia wheel and the hub is less than a preselected value and for permitting the inertia wheel to slip on the hub when a torque exerted between the inertia wheel and the hub attains the preselected value; and

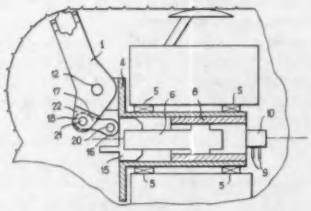
wherein the output shaft of the motor is connected to the input shaft of the gear reduction box via the hub of the flywheel, whereby the flywheel is coupled to the cutting tool via the gear reduction box.

4,171,148

CONTINUOUS BORING OR CUTTING MACHINE

Marcel Montacié, Paris, France, assignor to Bouygues, Clamart, France

Filed Jan. 17, 1978, Ser. No. 870,214
Claims priority, application France, Jan. 21, 1977, 77 01720
Int. Cl.[2] E21C 1/04
U.S. Cl. 299—61 3 Claims



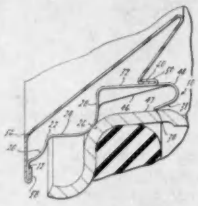
1. In a continuous boring or cutting machine having a rotatable head rotated about a fixed axis, said rotatable head including a fluid ram having a cylinder secured to said head and a piston rod reciprocable along said axis, a plurality of tool-holders pivotally supported at circumferentially spaced locations on said rotatable head about axes generally perpendicular to said axis and connection means between said piston rod and each of said tool-holders for pivoting said tool-holders on said rotatable head in response to reciprocable movement of said piston rod, the improvement of each of said connection means including a rigid link rotatable with said piston rod and said rotatable head, each link having a first end pivoted on said piston rod and an opposite end pivoted on an associated tool-holder so that each tool-holder is pivoted between extreme positions in response to reciprocal movement of said piston rod between extreme positions.

4,171,149

WHEEL TRIM RETENTION MEANS

Harold C. Marks, Northville, and James E. Gillespie, Westland, both of Mich., assignors to Norris Industries, Inc., Ypsilanti, Mich.

Continuation of Ser. No. 648,395, Jan. 12, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,582
Int. Cl.[2] B60B 7/06
U.S. Cl. 301—37 P 20 Claims



1. Wheel trim means for a wheel comprising:

an ornamental trim member;

retention means integrally formed on said trim member defining a generally axially inwardly extending flange portion;

a plurality of clips circumferentially spaced around the outside of said trim member and means affixing the outer portion of each said clips to said trim member adjacent the outer periphery thereof;

auxiliary attachment means integral with each said clips and including at least one pair of opposed fingers, one of said fingers being disposed radially inwardly from another of said fingers and said fingers resiliently grasping said flange portion in a non-biting relationship therebetween; and

a toothed member integral with said clip and adapted to bitingly engage said wheel, said clip engaging the radially outer surface of said flange portion so as to aid said biting engagement of said toothed member with said wheel when said wheel trim means is assembled thereto.

4,171,150

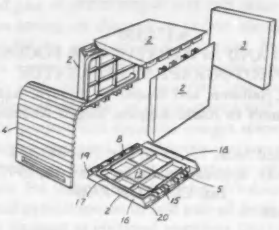
MOUNTABLE STORAGE FURNITURE

Bengt Söderlund, Stockholm, Sweden, assignor to AB Gustavsberg, Gustavsberg, Sweden

Filed Mar. 28, 1978, Ser. No. 891,028
Claims priority, application Sweden, Apr. 4, 1977, 7703938
Int. Cl.[2] A47B 87/00
U.S. Cl. 312—107 5 Claims

1. A kit composed of a plurality of parts capable of being assembled without the use of tools into a cubical cabinet comprising four wall panels made of injection molded plastic adapted to be joined together to form four sides of a six sided cubical cabinet, connecting devices extending along two sides of each of said panels, the connecting devices of each of said panels being adapted to engage the connecting devices of another panel to join said panels together, fixing securing devices formed on the same sides of each of said panels as said

connecting devices adapted to be joined together simultaneously with interengagement of said connecting devices, a torsionally rigid rear panel adapted to simultaneously engage each of said four walls to form a rear wall for said cubical cabinet, and a front closure member for said cabinet adapted to be mounted in operative relationship with at least two of said four wall panels, said connecting devices being structured to include male and female members, said male members cooperating to engage said female members with a press fit, with each of said wall panels being structured to have integrally formed on one edge thereof connecting devices comprising male members and on an opposite edge thereof connecting devices comprising female members, and with said securing devices being formed on said one edge to comprise lips and on said opposite edge to comprise openings adapted to have said lips engaged therein with a snap fit.

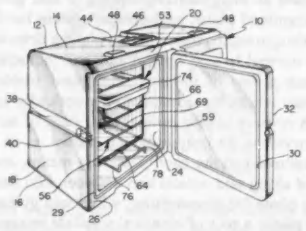


4,171,151

FOOD CARRIER

Thomas J. Luck, George Lamb Rd., Leyden, Mass. 01337

Filed Mar. 27, 1978, Ser. No. 891,130
Int. Cl.[2] A47B *77/08*
U.S. Cl. 312—236 **10 Claims**



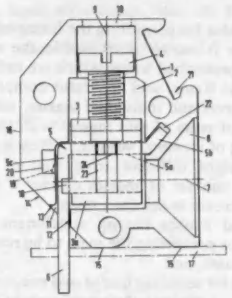
1. A carrier for transporting prepared meals and the like comprising, a lightweight container shell having insulated top, bottom, rear and sidewalls defining at least one interior compartment having an open front, an insulated door hingedly connected to said shell for closing said open front and sealing means between the front wall of said container shell and said door to provide a substantially airtight seal therebetween, said compartment inwardly tapered from the front to the rear thereof, and a stiff wire-like rack having a peripheral supporting frame and defining a plurality of vertically spaced shelves for receipt of food storage trays wedgingly received in said compartment, said compartment having means for limiting the depth to which said rack may be forced rearwardly within said compartment and means at the forward end of said compartment for releaseably maintaining said rack in said compartment, said means for limiting the depth position of said rack comprising a pair of opposed ledges inwardly directed from said top and bottom walls and adapted to contact said frame so as to space said frame from said rear wall.

4,171,152

TERMINAL FOR PRINTED CIRCUITS

Norbert Geiseler, Detmold, Fed. Rep. of Germany, assignor to C. A. Weidmuller KG, Detmold, Fed. Rep. of Germany

Filed Jul. 21, 1978, Ser. No. 926,984
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736620
Int. Cl.[2] H01R *9/10*
U.S. Cl. 339—272 A **13 Claims**



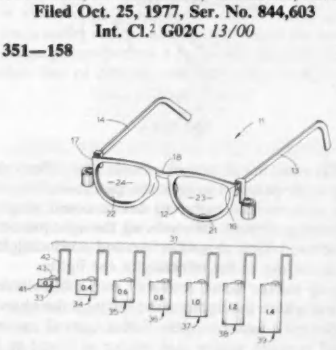
1. An electrical terminal for printed circuits, comprising an insulating casing with an internal space, a connector bar in the internal space of the casing having at an end thereof a tag projecting from the casing, through a first aperture provided in the casing, for connection to a printed circuit, and clamping means in the internal space of the casing for clamping an external conductor to the connector bar, said clamping means including a clamping screw, the casing being provided with a second aperture for insertion of a said external conductor, and having a first external surface substantially parallel to the axis of the clamping screw and opposite the said second aperture, a second external surface substantially parallel to the insertion direction for an external conductor, and a third external surface disposed between, adjoining, and oblique with respect to the said first and second surfaces, the first aperture being in the said third external surface and being defined by surfaces in the casing which are respectively substantially parallel to the first and second external surfaces and diverge towards the third external surface of the casing.

4,171,153

WEIGHT SYSTEM FOR GLASSES

James W. Melluish, 2318 Sheffield, Kalamazoo, Mich. 49008

Filed Oct. 25, 1977, Ser. No. 844,603
Int. Cl.[2] G02C *13/00*
U.S. Cl. 351—158 **11 Claims**



1. A method of fitting eyeglasses utilizing a lens-free frame having a frame front defining a pair of lens apertures and a pair of bows connected to the frame front, comprising the steps of:

fitting a prospective wearer with a lens-free frame having lens apertures of a selected size;

determining a simulated weight value which represents the weight of the prescribed lens by considering the size of the selected lens aperture and the power of the prescribed lens;

selecting a mass having a weight approximately equal to the simulated weight value representing the actual weight of the prescribed lens; and

simulating the actual weight of the prescribed lens which is to be positioned in the frame by removably attaching said selected mass to said frame in the vicinity of the lens aperture.

9. An apparatus for permitting the fitting of eyeglasses utilizing a lens-free frame so as to enable the simulation of the weight of the prescribed lenses which are to be fit into the lens apertures of the frame, said apparatus comprising:

a set of discreet and individual masses, said set including a plurality of pairs of said masses with the masses of each pair being of identical weight, and each of said pairs having a weight different from that of any other pair, whereby said set of masses defines a range of weights which increase in selected steps;

each of said masses having attachment means mounted thereon for permitting the mass to be removably mounted on said frame; and

chart means for selecting one of said masses which is approximately equivalent to the actual weight of the lens which is prescribed for the lens aperture of said frame, said chart means having ordinate and abscissa values which extend over a selected range, one of said values representing the lens size and the other of said values representing the lens power, and a set of weight values positioned within a substantially rectangular grid as defined by said abscissa and ordinate values, said weight values representing the approximate weight of an actual lens having the selected abscissa and ordinate values.

4,171,154

TTL METERING DEVICE IN A SINGLE LENS REFLEX CAMERA

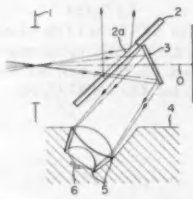
Toru Fukuhara, Isehara, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 27, 1978, Ser. No. 900,795

Claims priority, application Japan, Apr. 28, 1977, 52/53281[U]

Int. Cl.[2] G03B *7/08, 19/12*

U.S. Cl. 354—23 R **8 Claims**



1. A TTL metering device in a single lens reflex camera for measuring light passed through the picture taking objective lens of the camera, said metering device comprising:

a light sensing element for receiving the light passed through the picture taking objective lens and producing an output corresponding to the intensity of the light;

a swing-up mirror being rotatably movable between a first position where the light passed through the objective lens is reflected toward a view finder optical system and a second position where said mirror is raised so that said light may reach the film plane, said swing-up mirror partly having a light-transmitting area through which a part of said light may be transmitted toward the film plane when said swing-up mirror is in the first position; and

light reflecting means provided behind the swing-up mirror and adapted for directing light beam passed through the objective lens and the light-transmitting area of said swing-up mirror toward the light sensing element, said light reflecting means comprising a reflection area composed of a plural number of mirror elements regularly arranged and having directionally different reflection characteristics and a condensing area of light condensing and reflecting characteristics composed of a plural number of ring mirror elements arranged in a fashion of concentric circles surrounding said reflection area.

4,171,155

METHOD AND APPARATUS FOR FOCUSING A PHOTOGRAPHIC APPARATUS

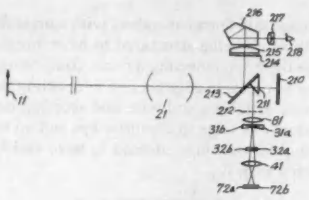
Masao Jyojiki, Saitama, and Kazuo Nakamura, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Mar. 17, 1978, Ser. No. 887,662

Claims priority, application Japan, Mar. 18, 1977, 52-29970

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—25 **14 Claims**



1. In a photographic apparatus having an objective and a device for determining when the objective has focused an image in a predetermined plane, said device comprising an optical system having a single optical axis extending only along a single straight line, said optical system having along said optical axis thereof an image plane normal to said optical axis and in which a given image is situated when the objective has properly focused an image corresponding to said given image in said predetermined plane, said optical system having along said optical axis spaced from said image plane a detecting plane which is also normal to said optical axis and including in said detecting plane a pair of identical elongated photosensitive detecting means which have respectively optically equivalent positions with respect to said optical axis, each of said detecting means providing an output which varies as an image is moved longitudinally along each detecting means, and optical means situated along said optical axis between said image plane and detecting plane for transmitting, when said given image is in said image plane, a pair of identical separate images, each of which is derived from said given image, respectively to identical positions along said pair of detecting means, and said optical means displacing the identical images transmitted to said pair of detecting means in opposite directions, respectively, along said pair of detecting means as said given image is displaced with respect to said image plane, so that the outputs of the said pair of detecting means will be different if said given image is before or behind said image plane along said optical axis while the outputs will be the same if the latter image is situated in the said image plane, said optical means including a relay lens means and a projector lens means spaced from each other along said optical axis with said relay lens means being situated nearer to said image plane than said projector lens means, said relay lens means receiving said given image from said image plane and transmitting said given image toward said projector lens means while the latter projects said identical images toward said detecting plane, and said optical means further including between said relay lens means and projector lens means a refracting means for receiving said given image from said relay lens means and for providing from said given image said pair of identical images which are transmitted by

said refracting means to said projector lens means to be projected thereby to said detecting plane, said refracting means including a pair of prism means spaced from each other along said optical axis with one or said pair of prism means being situated nearer to said relay lens means than the other of said pair of prism means, said one of said pair of prism means acting on an image received from said relay lens means to provide from the latter image a pair of identical images which are in line with each other, and which are situated in the plane of the other of said pair of prism means, and said other of said pair of prism means acting on the pair of in-line identical images received thereby to arrange said identical images received thereby into a pair of identical images which are parallel and spaced from each other, said projector lens means receiving from said other of said pair of prism means said parallel identical images to project said identical images respectively to said pair of detecting means at said detecting plane, and indicating means operatively connected with said pair of elongated detecting means for indicating when the identical images transmitted by said optical means to said pair of detecting means are respectively situated at identical positions therealong, for thus determining when the objective has been set to focus an image in said predetermined plane.

4,171,156

ELECTROMAGNETIC SHUTTER APPARATUS FOR CAMERA

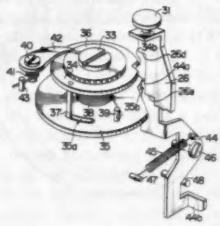
Katsuhiko Tsunefuji, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1978, Ser. No. 892,732

Claims priority, application Japan, Apr. 5, 1977, 52-39242; Apr. 20, 1977, 52-45567; Apr. 20, 1977, 52-45568; Apr. 20, 1977, 52-45569

Int. Cl.[2] G03B *7/38, 19/02*

U.S. Cl. 354—209 **5 Claims**



1. A film winding and shutter release control apparatus for an electromagnetic shutter apparatus for cameras which includes a shutter drive and control circuit for energizing a shutter drive coil in response to a shutter release operation to open a shutter by the electromagnetic cooperation between the coil and a permanent magnet and for automatically controlling an exposure period by a time constant circuit including a photometric, light receiving element; the control apparatus comprising a shutter release member adapted to be depressed by a shutter release operation to operate the shutter drive and control circuit, a first notched disc disposed for rotation in interlocked relationship with a film winding operation, a notch formed in the first disc at a position adjacent to the position occupied by the shutter release member for permitting a release operation of the member while it is being locked thereby, a resilient member having its one end connected with the first notched disc and adapted to be charged as the latter rotates, a second rotatable notched disc connected with the other end of the resilient member, a detent member interlocked with a shutter operation and normally preventing the second disc from rotating and unlocking the second disc as the shutter is opened, and another notch formed in the second disc at a position adjacent to the position occupied by the shutter release member to permit a release operation of the shutter release member while it is being locked thereby.

4,171,157

IMPROVED ELECTROPHOTOGRAPHIC APPARATUS FOR MULTIPLE COPIES

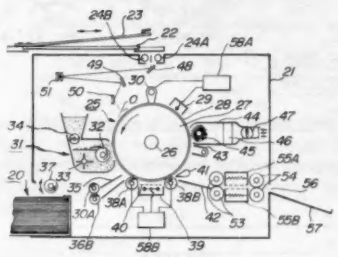
Yoshiro Suzuki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1978, Ser. No. 891,391

Claims priority, application Japan, Mar. 30, 1977, 52-34361; Mar. 31, 1977, 52-36483

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 TR **14 Claims**



1. An electrophotographic apparatus for printing a number of duplicated copies by repeating developing, transferring and fixing steps in succession for the same and single electrostatic charge latent image which corresponds to an image of a document to be duplicated comprising: an electrostatic charge retentive member including an electrically conductive substrate and a charge retentive layer applied on the substrate; means for forming the electrostatic charge latent image on the retentive layer means for developing the latent image with toner particles to form a visible toner image; means for transferring the toner image onto an image receiving member which is fed in contact with the charge retentive layer at least at a transfer region; means for applying a transfer bias voltage between said transferring means and the conductive substrate; means for fixing the transferred toner image on the image receiving member to form a final copy; first means for preventing undesired charge from being retained on that portion of the retentive layer which is not made in contact with the image receiving member in the transfer region, said first means comprising means for controlling said transferring bias applying means in such a manner that the application of the transfer bias voltage is allowed only when the image receiving member exists in the transfer region; and second means for removing an undesired charge retained on a peripheral portion of the retentive member free of contact with the image receiving means.

4,171,158

INSPECTION SYSTEM AND METHOD

Arnold O. Malvick, Manteca; Wayne W. MacDonald, Oakdale, and Carl M. Beckwith, Modesto, all of Calif., assignors to TRI/Valley Growers, San Francisco, Calif.

Continuation-in-part of Ser. No. 604,596, Aug. 14, 1975, Pat. No. 4,025,422. This application May 2, 1977, Ser. No. 793,041

Int. Cl.[2] G01N *21/32*

U.S. Cl. 356—239 **7 Claims**

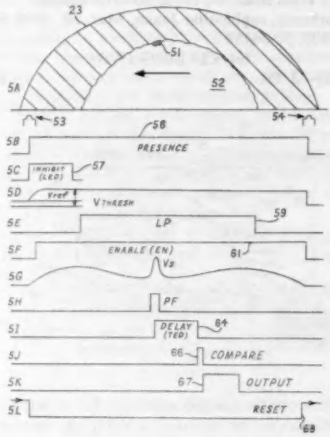
6. An inspection system for detecting flaws in items normally subject to physical variation between successive items and comprising

a light source,

a line of light sensors disposed to receive light from said source,

means passing items to be inspected in single file between said source and said line of sensors transversely of said line of sensors for intercepting light from said source,

compensation circuitry for physical variation between successive items connected to said sensors for producing a reference voltage for each of said items from the average of the output of predetermined sensors for each of said items and comparing each sensor output for an item to said reference voltage for that item, then producing a flaw signal from any one of said comparisons wherein a predetermined difference exists, said circuitry further producing logic signals indicating presence of an item between said light source and said sensors from combinations of the outputs of said predetermined sensors; and



logic circuitry connected to receive said flaw signals and said logic signals and producing an output signal upon the occurrence of predetermined logic combinations of signals applied to said logic circuitry as an indication of a flaw in an item passing through said station.

4,171,159

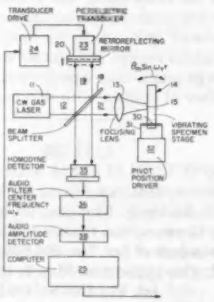
OPTICAL HOMODYNE MICROSCOPE

Matthew B. White, 258 Forest Ave., Cohasset, Mass. 02025

Filed Jul. 14, 1977, Ser. No. 815,879

Int. Cl.[2] G01B *9/02*

U.S. Cl. 356—349 **20 Claims**



1. Apparatus for determining the submicroscopic surface characteristics of an object which is mounted on a stage with the face to be examined exposed comprising:

means for subjecting said stage to a series of different states of motion;

means for illuminating the exposed areas of said object with coherent monochromatic radiation of known amplitude and frequency,

said states of motion causing said radiation to be reflected and scattered from said object in a multiplicity of different frequency components with the amplitude and phase of each instantaneous overall component determined by the amplitudes and phases of components scattered from individual points on said surface,

the scattered radiation contributions of amplitude and phase from said individual points being representative of the at rest radiation scattered from each point and the effect of said states of motion thereon; and

means for measuring and recording the amplitude and phase of selected ones of said different overall frequency components for each different state of motion so that an image of said object may be constructed.

4,171,160

DISTANCE MEASURING INSTRUMENT

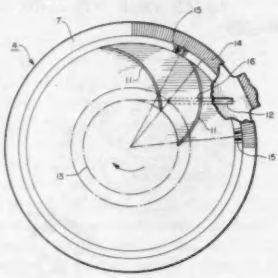
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,715

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650422

Int. Cl.[2] G01B *9/00;* **G01C** *3/08*

U.S. Cl. 356—375 **7 Claims**



1. An apparatus for measuring a length corresponding to the one dimensional position of a surface, said apparatus comprising:

means for directing an incident beam of coherent light at a substantially constant angle onto the surface;

receiving means for detecting a portion of the beam after reflection from the surface;

a rotatable disc positioned within the receiving means;

at least one involutely shaped slit diaphragm defined by the disc;

a fixedly-mounted slot diaphragm positioned within the receiving means adjacent the disc, the slot diaphragm being arranged tangentially to the basic circle of the involute which defines the slit diaphragm;

a movable aperture defined by the intersection of the slit diaphragm and the slot diaphragm;

a photosensor positioned in the receiving means to detect light which has passed through the movable aperture after being reflected from the surface; and

position sensing means for sensing the position of the movable aperture to measure the entrance angle at which reflected light detected by the photosensor enters the receiving means and thereby to determine the length.

4,171,161
TESTING OPAQUE WORKPIECES, PARTICULARLY TINY OR THIN ELONGATED OBJECTS SUCH AS PINS, BOLTS, WIRES, OR THE LIKE, FOR ORIENTATION, SIZE AND MATERIAL INTEGRITY

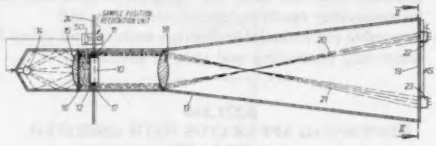
Rainer Jüng, Weinstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,420

Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2620240

Int. Cl.[2] **G01B** *11/00*

U.S. Cl. 356—383 **14 Claims**



1. Apparatus to test individual elongated opaque workpieces (**10**) with respect to orientation, size, and the like, comprising

a workpiece transport path (**24**);

a transparent workpiece receptacle (**17**) positioned within said transport path;

a single pulsed light source (**14**, **14'**) generating a pulse of a beam of light (**16**) larger than said workpiece and irradiating said receptacle and a workpiece (**10**) therein which, when in the path of the beam (**16**) of light will partially block the path of the beam and thereby generate a core shadow (KS) of the workpiece;

means (**50**) sensing presence of a workpiece in said receptacle and controlling said pulsed light source to provide said pulse of light;

projecting means (**18**) and an impingement plane (**19**) projecting the pulse of the beam of light and the shadow of the workpiece on said plane (**19**);

two electro-optical transducer means (**22**, **23**) located adjacent the end portion of the plane (**19**) transversely with respect to the longitudinal extent of the shadow image (**10'**, **25'**, **26'**, **26''**, **26'''**) projected by the workpiece on said plane, the coverage area of each of said transducer means forming a test zone overlapping a portion of the illuminated screen adjacent the end of the shadow image, said transducer means measuring the relative intensity of received light (L) in relation to the core shadow (KS) on said plane at the end portions of said plane and providing electrical output signals representative of said measured amount of light;

and electrical comparator means (**40**, **41**, **42**, **45**, **46**) connected to both said transducer means and comparing the output thereof and providing an output test signal representative of said comparison.

4,171,162
SYSTEM FOR POSITIONING AN OBJECT IN AN OPTICAL PROJECTION SYSTEM

René Gerard, and Michel Lacombat, both of Paris, France, assignors to Thomson-CSF, Paris, France

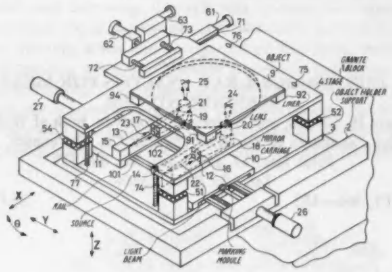
Filed Apr. 17, 1978, Ser. No. 897,166

Claims priority, application France, Apr. 20, 1977, 77 11911

Int. Cl.[2] **G01B** *11/00;* **H01L** *21/68*

U.S. Cl. 356—401 **5 Claims**

1. A system for positioning an object in an optical system for projecting at least one pattern onto a plate, the surface of said object having a non-uniform transparency forming said pattern and at least a first pair of reference marks; said system comprising an object holder, a stage being kept integral with said object, first displacement means for displacing said stage in its plane relative to said object holder, two projector arms enabling two regions of said object to be illuminated through a second pair of reference marks, second displacement means for controlling the spacing of said two projector arms and display means collecting the light emerging from said two regions and providing an image of said regions; said second pair of reference marks forming a reference system having a variable inter-



axis interval and being fixed in its orientation relative to said object holder, said first and second displacement means enabling coincidence to be established between the images of said first and second pairs of reference marks provided by said display means.

4,171,163
MOULDING OF PLASTICS

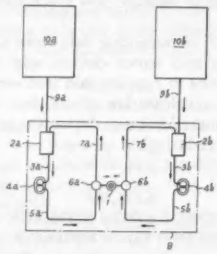
Wallace G. Hawkins, Bridgewater, England, assignor to C. & J. Clark Ltd., Somerset, England

Filed Sep. 7, 1977, Ser. No. 831,346

Claims priority, application United Kingdom, Sep. 7, 1976, 37084/76

Int. Cl.[2] **B01F** *15/04, 15/06*

U.S. Cl. 366—145 **5 Claims**



1. In an apparatus for use in the production of molded plastic which requires that at least two components, which are liquid at their operating temperature, be intimately mixed before being introduced into the mold, said apparatus including: a mixing head having a body with a bore therethrough; a mixing screw rotatably mounted in said bore; and for each component to be mixed, a reservoir tank connected to said mixing head, a pump means between said reservoir tank and said mixing head for pumping a liquid component from said reservoir tank to said mixing head, valve means for selectively directing the flow of liquid to said mixing head from said reservoir tank and back to said reservoir tank from said mixing head, and control means connected to said valve means for simultaneously operating said valve means,

an improvement comprising:

an improved mixing head having a body with said valve means being formed within said body;

a metal block having said improved mixing head, said reservoir tanks and said pump means connected thereto in good thermal contact therewith;

said improved mixing head body and said metal block having ducts formed therethrough which convey said liquid

components between said mixing head and said reservoir tank through said pump means and valve means; and

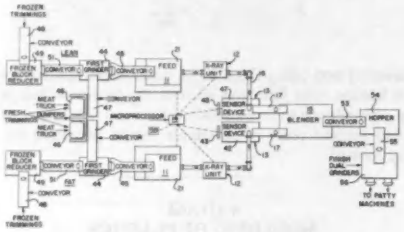
at least one thermostatically controlled electric heating element in each reservoir tank for maintaining the liquid component in each reservoir tank at a constant temperature.

4,171,164

CONTINUOUS X-RAY ANALYSIS FOR MEAT BLENDING SYSTEM

William H. Groves, and Andrew E. Donovan, both of Waltham, Mass., assignors to The Kartridg Pak Co., Davenport, Iowa

Filed Dec. 12, 1977, Ser. No. 859,579
Int. Cl.[2] B01F *15/04*
U.S. Cl. 366—152 **15 Claims**



1. An apparatus for automatically blending meat to a desired fat percentage, comprising:

feed means for producing a continuous stream of meat;

a fat analysis unit down-line of said feed means for continuously determining the ongoing fat percentage of said stream of meat;

a sensor device for monitoring the meat stream through said fat analysis unit to measure how much meat passes therethrough;

a microprocessor for receiving data from said fat analysis unit and from said sensor device, said microprocessor utilizing said data to regulate said feed means; and

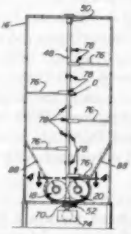
meat blender means down-line of said feed means, said fat analysis unit and said sensor device for mixing meat that has passed therethrough.

4,171,165

CELLULOSE INSULATION STORAGE BIN WITH IMPROVED DEBRIDGER

David C. Card, Denver, Colo., assignor to Diamond Insulation Industries, Inc., Denver, Colo.

Filed Jul. 17, 1978, Ser. No. 924,950
Int. Cl.[2] B01F *7/08, 7/20, 15/02*
U.S. Cl. 366—186 **14 Claims**



1. A storage bin for temporary storage of cellulose insulation, said bin comprising:

a hopper having an upper end and a lower end;

an inlet at said upper end for receiving cellulose insulation;

an outlet at said lower end for supplying insulation to the next operation;

an auger at the bottom of said hopper for feeding insulation in said hopper through said outlet;

a vertical shaft mounted in said hopper for rotation;

a plurality of rotatable vanes spaced along said shaft and angularly displaced from each other so that said vanes sweep across substantially the entire cross-sectional area of said hopper to minimize bridging of the insulation across said hopper as it falls from said inlet down to said outlet;

a plurality of sleeves, each of said sleeves having an inner and outer end, said inner end being attached to said shaft for removably receiving one of said vanes; and

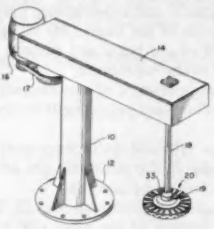
a removable pin extendable through each of said vanes for removably connecting said vane to said sleeve.

4,171,166

DISPERSING APPARATUS WITH GROOVED IMPELLER

Frank R. Trowbridge; Walter B. Bryan, and Charles R. Price, all of Macon, Ga., assignors to Morehouse Industries, Inc., Fullerton, Calif.

Filed Jun. 26, 1978, Ser. No. 918,699
Int. Cl.[2] B01F *7/26*
U.S. Cl. 366—316 **14 Claims**



1. An industrial dispersion apparatus comprising:

impeller means rotatable to disperse a solid material in a liquid formed of a resilient disc having opposite faces disposed generally perpendicular to the axis of said disc each formed with a plurality of circumferentially spaced, radially extending grooves having opposed generally parallel sidewalls extending substantially normal to said faces and terminating at a respective face to form wearing edges, said grooves on one face being circumferentially offset with respect to the grooves on the other face so that a groove on one face is circumferentially spaced between the two adjacent grooves on the other face.

4,171,167

TYPE HEAD CLEANER

Everett W. Swartwout, Duxbury, Mass., assignor to Vikor Company, Inc., Nashua, N.H.

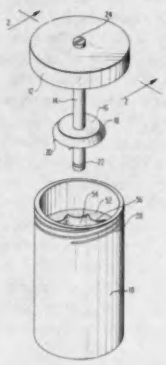
Filed Aug. 8, 1977, Ser. No. 822,629
Int. Cl.[2] B41J *29/00*
U.S. Cl. 400—702 **10 Claims**

1. A cleaner for cleaning a removable typewriter type head of the kind having a generally spherical type surface and an aperture through a portion thereof, and locking means associated with said aperture for securing said head to a typewriter, said cleaner comprising

A. means forming a stem for extension through said aperture,

B. means associated with said stem for engagement with said type head to prevent rotation of said head about said stem when torque is applied thereto, said type head engagement means comprising means forming a platform on said

stem and having at least one shoulder on said platform for engagement with said type head, and



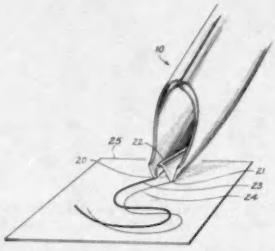
C. a container for holding a cleaning liquid and having in the interior thereof a cleaning element defining a yieldable passageway providing snug passage to said head when said stem is passed therethrough.

4,171,168

EMBOUCHURE PENS HAVING PLURAL CONTIGUOUS NIBS

Ben Braun, 15 Georgia Dr., Syosset, N.Y. 11791

Filed Aug. 22, 1977, Ser. No. 826,502
Int. Cl.[2] B43K *17/00*
U.S. Cl. 401—35 **9 Claims**



1. In an embouchure pen made of resilient material and comprising opposed inner and outer nibs forming at forward ends thereof contiguous outer and inner lips constituting means for tracking ink, the improvement comprising structural means in at least one of said nibs for stiffening the lips of said pen and comprising an elongated ridge extending from the forward end of said pen longitudinally rearwardly.

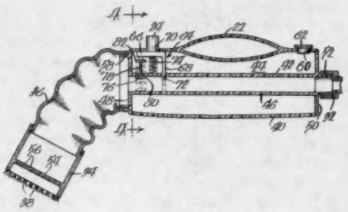
4,171,169

HAND HELD WASHER

Stanley B. Williams, 2088 E. Empire Lot 151, Benton Harbor, Mich. 49022

Filed Jan. 3, 1978, Ser. No. 866,700
Int. Cl.[2] A46B *11/02;* **B05B** *7/30*
U.S. Cl. 401—41 **6 Claims**

1. A hand held washer comprising a housing having a passage therethrough and a compartment therein for holding a supply of soap; a handle on said housing for being gripped by a user of said washer; means for connecting one end of said passage with a supply of water under pressure; a brush; a relatively flexible conduit connected between an opposite end of said passage and said brush and flexible to mount said brush in various positions with respect to said housing, and manually manipulatable valve means for selectively blocking and unblocking an opening between said compartment and said passage, said valve means being mounted in said housing and including a manually depressible plunger extending outward of said housing forward of said handle and toward said brush, a first valve portion connected to said plunger for movement therewith and extending through said opening between said compartment and said passage, said first valve portion blocking said opening when said plunger is not depressed, unblocking said opening when said plunger is partially depressed, and closing said opening when said plunger is fully depressed, and a second valve portion connected with said plunger for movement therewith and extending into said passage on the side of said opening toward said one end of said passage, said second



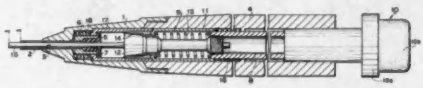
valve portion unblocking said passage when said plunger is not depressed and moving to a position fully blocking said passage when said plunger is fully depressed, so that when said plunger is not depressed said opening is blocked and said passage is unblocked for a flow of clear water to said brush, when said plunger is partially depressed said opening is unblocked and said passage is partially blocked for a restricted and reduced flow of soapy water to said brush, and when said plunger is fully depressed both said opening and said passage are blocked so that there is no flow of soap or water to said brush, whereby said valve means is conveniently and selectively operable to control the flow of soap and water to said brush for soaping, scrubbing or rinsing an article to be cleaned.

4,171,170

AUTOMATIC PENCIL

Hidehei Kageyama, and Takahiko Suzuki, both of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Jun. 9, 1977, Ser. No. 805,152
Claims priority, application Japan, Mar. 31, 1977, 52-40465; Apr. 2, 1977, 52-41492
Int. Cl.[2] B43K *21/22*
U.S. Cl. 401—65 **4 Claims**



1. An automatic pencil comprising:
(a) an outer tube (**4** or **101**) to be held by a user and having front and rear ends and a first axial opening therein;
(b) a guide means (**1** or **102**) located at the front end of said outer tube and having a second axial opening in alignment with said first axial opening to form an axial bore (**3**);
(c) an inner tube (**8** or **103**) movably located in the axial bore;
(d) a knocking portion means (**10** or **105,106**) projecting from the rear end of said outer tube and located in said axial bore, said knocking portion means in contact with said inner tube for transmitting a forward knocking force to said inner tube;
(e) a chucking pawl (**12**) connected to said inner tube for holding a lead piece (**15** or **111**) axially located in said bore;
(f) a sleeve (**11** or **108**) located between said outer tube and

said inner tube movably along its axis with respect to the outer tube and inner tube;

(g) a first spring (**13** or **110**) disposed in and engaging said sleeve and said inner tube for urging said sleeve forward with respect to said inner tube;

(h) a chucking ring (**14** or **107**) encircling said chucking pawl movable with respect to said pawl and in a limited range, said ring abutting the front end of said sleeve, said movement thereby causing said pawl to selectively hold the lead piece in position and permitting release of the lead piece when said inner tube is moved to the position at which said ring reaches the forward end of its movable range;

(i) a second spring (**16** or **109**) engaging said sleeve and said outer tube for urging said sleeve forward with respect to said outer tube;

(j) a lead piece guide (**2,6** or **113,114**) having a central bore in which the lead piece is located, said lead piece guide extending from the forward end of said guide means exteriorly of the pencil and selectively movable in a limited range along its axis with respect to said guide means; and

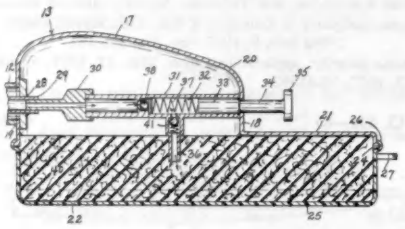
(k) a friction member (**5** or **115**) movable between said lead piece guide and said chucking pawl within said guide means and having a bore within which the lead piece passes with a predetermined friction and a flange portion (**7**) which engages an inner portion of said guide means to produce a predetermined friction against movement of said friction member with respect to said guide means whereby said lead piece guide retracts as the lead piece wears due to pressure of said lead piece on a writing surface so that the lead piece advances when pressure on the lead piece is released, the advancing being due to said first spring urging said sleeve forward while said lead piece guide remains in a retracted position due to friction between said friction member and said guide means.

4,171,171

LONG HANDLED LIQUID DISPENSING APPLICATOR

Ronald B. Jones, 901 6th St., SW., Washington, D.C. 20024

Filed Feb. 7, 1978, Ser. No. 875,861
Int. Cl.[2] B43K *5/18*
U.S. Cl. 401—150 **3 Claims**



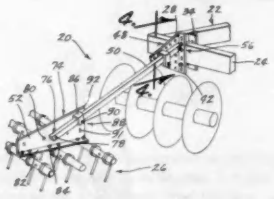
1. A liquid dispensing applicator device comprising an elongated handle, a head member of extended area rigidly secured to an end of the handle and having a vertical shoulder portion opposite the handle, a pad of sponge-like absorbent material of similar extended area secured to the head member, a tray member for receiving liquid to be dispensed shaped to receive said pad of absorbent material, cooperating snap-fitting interlocking sealing means on the head member and tray member for releasably fastening said tray member to said head member in substantially airtight covering relationship with said pad of absorbent material, wherein said handle is hollow to serve as a reservoir of liquid, and conduit means communicatively connecting said hollow handle with said pad of sponge-like absorbent material, wherein said conduit means includes pump means rigidly secured to said vertical shoulder portion for forcing liquid from said hollow handle to said pad, wherein said handle is in the form of an elongated rigid duct defining a reservoir, wherein said conduit means comprises a tube connected to the intake of said pump means and secured to said head member and extending inside said duct for the major portion of the length of the duct and terminating adjacent the free end of the handle, wherein said free end is arranged to be lowermost when the head member is disposed horizontally, whereby to insure immersion of the end of the tube in the liquid in this position of the device so that with the head member in said horizontal position the pump means may be actuated to form a layer of liquid in the bottom of said tray member sufficient to saturate the bottom portion of said pad, wherein said pump means is provided with a bore containing a pump plunger, said plunger having an externally projecting actuating element located at said vertical shoulder portion for reciprocating the plunger in said bore, and wherein said pump means has a discharge spout which depends from said bore into said pad of sponge-like absorbent material, said pump means including a suction-actuated inlet check valve between said bore and said tube and a pressure-actuated outlet check valve between said bore and said discharge spout located at the entry to said discharge spout.

4,171,172

AUXILIARY IMPLEMENT MOUNT

Larry C. Johnston, Audubon, Iowa, assignor to Emmert Mfg. Co., Inc., Audubon, Iowa

Filed Jun. 6, 1977, Ser. No. 803,804
Int. Cl.[2] A01B *5/04, 15/00, 49/02;* **F16B** *9/02*
U.S. Cl. 403—71 **9 Claims**



1. An auxiliary implement mount, adapted for use in combination with different sizes and shapes of tool bars of a first implement, comprising:

a single L-shaped plate member forming a triangular shaped upper plate portion with at least six holes disposed in a triangular configuration adjacent the periphery of the upper plate portion, one edge of said plate member having a rectangular flanged portion, extending along its entire length with a series of apertures disposed therein, said flanged portion of said plate extending at a right angle with respect to said upper plate portion and being adapted to abut said first implement's tool bar;

means for attaching said flanged portion of said plate to said first implement's tool bar so that said plate is transverse to the longitudinal axis of said first implements tool bar;

a rod having an opening in one end thereof;

means for pivotally attaching said rod to said plate, said pivotal means including a pin extending through said opening in said rod and through one of the holes in said plate;

means for attaching a portion of said rod to another portion of said plate adjacent another hole; and

means for attaching an auxiliary implement to the other end of said rod;

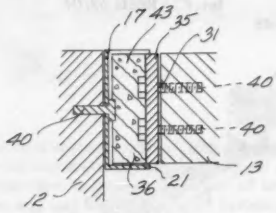
whereby the plate member may be rotated to multiple operating positions to accommodate tool bars having different sizes, shapes, and inclinations.

4,171,173

APPARATUS AND METHOD FOR CONNECTING AN END OF A HORIZONTAL BEAM TO A VERTICAL SURFACE OF SUPPORTING STRUCTURE

Nelson J. Hymans, 5116 S. 81st St., Ralston, Nebr. 68127

Filed Jul. 17, 1978, Ser. No. 925,249
Int. Cl.[2] B25G 3/34
U.S. Cl. 403—189 10 Claims



1. An apparatus for connecting an end of a horizontal beam to a vertical surface of supporting structure comprising:

a female bracket for securement to the vertical surface, said female bracket being a rectangular box-like structure having an open top, a front wall having an opening formed therein which extends downward from said open top, a bottom wall, a rear wall and opposing side walls;

a male bracket for securement to the end of the horizontal beam, and having a portion thereof projecting laterally of the beam;

said male bracket and said female bracket being of such relative size that said male bracket will enter said female bracket open top and will seat on said bottom wall; and

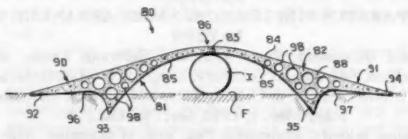
grout disposed in said female bracket on both sides of said male bracket.

4,171,174

SYSTEM FOR DEPOSITING AND PROTECTING SAND AND OTHER LITTORAL DRAFT MATERIAL

Ole J. F. Larsen, Hjerting, Denmark

Continuation-in-part of Ser. No. 644,916, Dec. 29, 1975, Pat. No. 4,077,222. This application Nov. 8, 1977, Ser. No. 849,648
Int. Cl.[2] E02B 3/04
U.S. Cl. 405—25 30 Claims



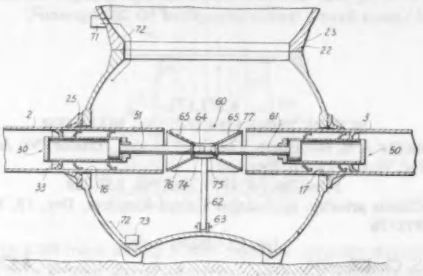
1. A device for protecting a lengthy installation on the floor of a body of water comprising generally polygonally shaped means as viewed in top plan for defining a generally arch-shaped member as viewed in end elevation having an upper convex surface and a lower concave surface adapted to open in a direction toward the floor of a body of water, said arch-shaped member having a generally central apex portion and opposite leg portions, and said convex and concave surfaces diverge away from each other in a direction away from said apex portion and toward said leg portions.

4,171,175

APPARATUS FOR UNDERWATER WELDING OF PIPES

Philippe C. Nobileau, Neuilly sur Seine; Rene M. Dermy, Courcouronnes, and Guy J. Fleury, Paris, all of France, assignors to Compagnie Francaise des Petroles, Societe Anonyme, Paris Cedex; Etudes Petrolieres Marines, Societe a Responsabilite Limitee, Paris; Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme, Nantes; Compagnie Maritime d'Expertises, Societe Anonyme, Marseille; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS), Societe Anonyme, Paris and Societe Nationale Elf Aquitaine (Production), Tour Aquitaine, Courbevoie, all of, France

Filed Jul. 19, 1976, Ser. No. 706,324
Claims priority, application France, Jul. 28, 1975, 75 23429
Int. Cl.[2] B63C 11/00
U.S. Cl. 405—170 15 Claims



1. An apparatus for joining the ends of two submerged pipes in a gaseous atmosphere, comprising:

(a) a receptacle having a wall defining two openings, each opening receiving a pipe end and surrounded by respective external sealing means for sealing against the pipe end,

(b) a personnel intervention unit adapted to be attached to said receptacle,

(c) an opening in said receptacle for communication with said intervention unit, and

(d) a pair of obturators individually associated with the respective pipes for insertion in the ends thereof before the pipes are introduced into the receptacle for isolating the receptacle from the medium contained in the pipes,

(e) each obturator comprising:

(1) a cylinder and piston rod assembly,

(2) internal sealing means for sealing against the pipe interior,

(3) first control means accessible from the exterior of the obturator for advancing and retracting the piston rod, and

(4) second control means accessible from the exterior of the pipe for positioning the internal sealing means.

4,171,176

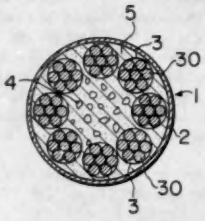
FLEXIBLE BAR REINFORCED CONCRETE PILE AND METHOD OF CONSTRUCTION

Kunimitsu Yamada, Tokyo, Japan, assignor to Taisei Corporation and Neturen Co. Ltd., both of Tokyo, Japan

Filed Aug. 25, 1977, Ser. No. 827,811
Claims priority, application Japan, Sep. 28, 1976, 51-115401
Int. Cl.[2] E02D 5/18
U.S. Cl. 405—257 12 Claims

1. A flexible bar reinforced concrete pile comprising a steel tube containing therein a plurality of jointless high-strength flexible bars, strands or bundles of bars or strands located axially along the inside wall of said steel tube, and the remaining space within the steel tube being packed with prepacked concrete or mortar, said concrete pile being such that the high-strength flexible bars, strands or bundles of bar or strand are not anchored to the steel tube at the ends thereof and being further characterized in that said bars, strands or bundles of

bars or strands do not extend to the entire length of the tube so that at least one end of said steel tube extends beyond the length of said high-strength flexible bars, strands or bundles of



bars or strands and wherein the steel tube has a tensile strength of 30–60 kg/mm^2 and each individual high strength flexible bar and strand have a tensile strength of 90–200 kg/mm^2.

4,171,177

SCREW THREAD CUTTING MEMBER

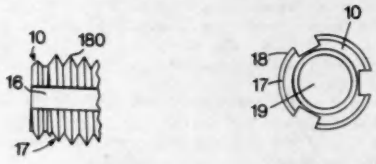
Timothy J. R. Barnsdale, The Croft House, Haselor, Nr. Alcester, Warwickshire, England

Filed Dec. 6, 1977, Ser. No. 858,029

Claims priority, application United Kingdom, Dec. 13, 1976, 51871/76

Int. Cl.^{2} B23G *5/06*

U.S. Cl. 408—218 **6 Claims**



1. A male screw thread-formed member having a thread cutting action, comprising a generally cylindrical body having at least two angularly spaced apart longitudinal flutes each defined by a groove in the outer periphery of said body and extending along the body from at least one end thereof, said body also having a helically threaded portion of substantially full V-thread form about said outer periphery with said flutes extending into said thread form, said body further having at at least said one end thereof at least one rib of substantially helical form of generally peripheral V-form in cross section adjacent said threaded portion and of reduced diameter relative thereto and co-axial therewith, said rib having said flutes passing through the periphery thereof to thereby form between said flutes a plurality of reduced V-thread formations of varying cross section and relative radial heights; which follow a helix corresponding to that of the substantially full V-thread form whereby resulting pointed cutting formations provide peaks of different radial heights, and at least some of said rib formations are positioned, at the intersection of said formations and said flutes, in offset disposition relative to said helix of said threaded portion for effecting a distributed thread cutting action thereat.

4,171,178

APPARATUS FOR AUTOMATICALLY HANDLING STACKS OF BAGS

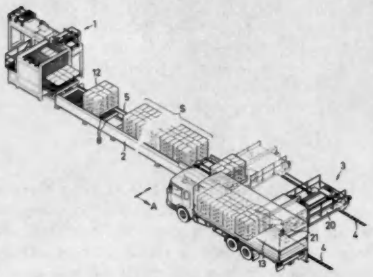
Richard Birkenfeld; Werner Thun, and Peter Aka, all of Beckum, Fed. Rep. of Germany, assignors to Maschinenfabrik E. Möllers GmbH & Co., Beckum, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 890,950

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714333

Int. Cl.^{2} B65G *67/04*

U.S. Cl. 414—45 **11 Claims**



1. Apparatus for automatically handling bags comprising a first means for forming bags continuously received from a source into a stack consisting of a number of superposed layers of bags, an elongated conveying track having a first end and a second end with the first end positioned adjacent said first means for receiving a stack of bags therefrom, said track arranged to convey a stack of bags from the first end to the second end thereof, said conveying track including a support member for receiving the stack of bags and said support member having a support surface on which the stack rests and said support member having a plurality of recesses formed therein open to and extending downwardly from the support surface, second means for removing a stack of bags from said support member at the second end of said conveying track and for placing the stack on a loading surface wherein the improvement comprises that said conveying track comprises first rails and second rails extending horizontally from said first end to said second end thereof with said first rails being spaced above said second rails, said support member comprises a carriage movably mounted on said rails for transport between the first and second ends thereof, third means at said second end of said track for receiving said carriage from said first rails and for moving the carriage in the vertical direction and placing said carriage on said second rails, and fourth means at the first end of said track for moving said carriage from said second rails to said first rails.

4,171,179

APPARATUS FOR LOADING SACKS ARRANGED IN LAYERS

Richard Birkenfeld; Peter Aka, and Hellmuth Lange, all of Beckum, Fed. Rep. of Germany, assignors to Maschinenfabrik E. Möllers GmbH & Co., Beckum, Fed. Rep. of Germany

Filed Mar. 1, 1978, Ser. No. 882,379

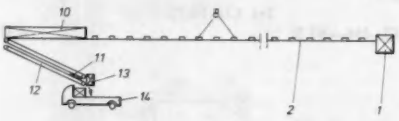
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713135

Int. Cl.^{2} B65G *57/03*

U.S. Cl. 414—85 **12 Claims**

1. Apparatus for conveying sacks or the like from a supply source to a loading surface, for forming layers of the sacks and for stacking the layers directly on the loading surface or one on top of the other, comprising first means for conveying sacks from the supply source, second means arranged to receive a plurality of sacks from said first means for forming the sacks into a layer, third means for conveying the layers of sacks from the second means, and fourth means for receiving the layers of

sacks from said third means and for placing the layers in a stacked arrangement on the loading surface, wherein the improvement comprises that said third means are variably operable for continuously delivering layers of sacks to said fourth means during normal operation and during the replacement of the loading surface for movement in a step-wise manner for



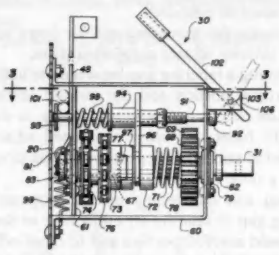
receiving and retaining a number of layers thereon so that said first and second means continue to operate until a new loading surface is positioned to receive the layers of sacks from said fourth means, and said fourth means are variably operable for changing the speed at which layers of sacks are transferred from said third means to the loading surface.

4,171,180

FAST ACTING CLUTCHING AND DE-CLUTCHING MECHANISM

Robert A. Wagstaff, New Holland; Bernard T. Jenny, Lancaster, and Roger L. Risser, Leola, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 20, 1978, Ser. No. 888,279
Int. Cl.[2] B60P *1/38*
U.S. Cl. 414—502 **7 Claims**



1. A fast acting clutching and de-clutching mechanism comprising:

(a) first and second alternative substantially parallel input drive shafts drivingly coupled together by intermeshing gear means such that rotation of one causes an opposite rotation of the other;

(b) power output means affixed to said second drive shaft;

(c) first and second engageable clutch jaws affixed respectively to said second drive shaft and said power output means;

(d) a movable control mechanism connected to said first clutch jaw to move it into and out of engagement with said second clutch jaw, said movable control mechanism including an elongate axially movable pin having an axis substantially parallel to the axes of said first and second drive shafts and an arm fixed to said pin and extending laterally toward said first clutch jaw and at least partially surrounding and engaging same whereby said clutch jaw may rotate relative to said arm, yet moves axially therewith into and out of engagement with said second clutch jaw;

(e) first biasing means urging said pin in a direction to move said first clutch jaw out of engagement with said second clutch jaw; and

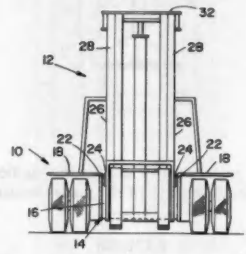
(f) trigger means movable between a first position in engagement with said pin wherein said first clutch jaw is in engagement with said second clutch jaw and against the urging of said biasing means and a second position out of engagement therewith allowing said pin to move said first clutch jaw out of engagement with said second clutch jaw.

4,171,181

LATERAL SUPPORT DEVICE FOR OUTER MAST UPRIGHT

Charles R. Chelin, Peoria, Ill., assignor to Towmotor Corporation, Mentor, Ohio

Filed Feb. 4, 1977, Ser. No. 765,518
Int. Cl.[2] B66F *9/22*
U.S. Cl. 414—636 **13 Claims**



1. In a lift truck having a mast assembly pivotally mounted adjacent a bottom thereof to a frame, said mast assembly having a pair of spaced apart outer mast members each having a lateral outer surface, and tilt motor means for tilting said mast assembly forwardly and rearwardly relative to said frame, a lateral support device for said mast assembly, comprising:

a pair of guide means each affixed to a respective one of said laterally outer surfaces and said frame a spaced distance from the pivotal mounting of the mast assembly to the frame; and

a pair of bearing means affixed to a respective other of said lateral outer surfaces and said frame, each of said bearing means being in position to slideably receive a respective one of said guide means on operation of said tilt motor means to tilt said mast assembly rearwardly to thereby bearingly hold said mast assembly steadily between said pair of bearing means whereby during operation of said lift truck lateral motion of said mast assembly is restricted when said guide means is held by said bearing means.

4,171,182

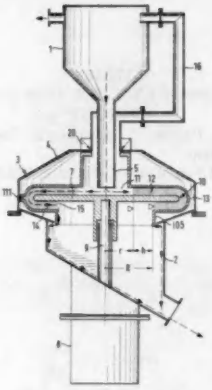
EXTRACTOR PUMP FOR FLUIDS UNDER VACUUM

Václav Feres, Haid-Neustrasse 14, 7500 Karlsruhel, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,611
Int. Cl.[2] F01D *1/36*
U.S. Cl. 415—90 **15 Claims**

1. A pump for extracting fluids from a vacuum enclosure into an enclosure at a higher pressure, the pump comprising a pump housing, a pressure tube extending substantially tangential to the pump housing, an impeller means rotatably mounted relative to parts of the pump housing a feed means for axially delivering a fluid to the impeller means, and fluid transporting means on the impeller means for transporting fluid from the feed means to the pressure tube, characterized in that the impeller means includes a suction space, the fluid transporting means includes transport channel means in communication with the suction space for leading fluid from the suction space to the pressure tube, said transport channel means being constructed so that fluid is led outwardly from the suction space and then inwardly relative to the impeller means to the pres-

sure tube, means are provided for communicating the suction space of the impeller means with the vacuum enclosure, and in



that means are provided for sealing the suction space with respect to non-rotating parts of the pump housing.

4,171,183

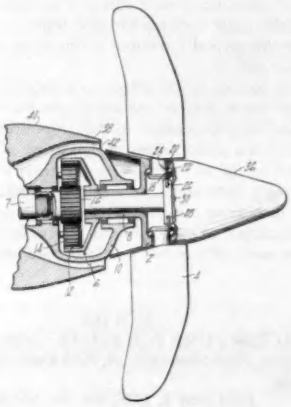
MULTI-BLADED, HIGH SPEED PROP-FAN

Robert W. Cornell, West Hartford, and Carl Rohrbach, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 24, 1976, Ser. No. 726,338

Int. Cl.[2] B64C *11/06, 11/14*

U.S. Cl. 416—94 **10 Claims**



1. A small diameter multi-blade prop-fan integrated system having:

from 6 to 12 short blades thereon of a length to make a fan of from about 10 to 14 feet in diameter,

each blade having a very thin airfoil shape based on the blade length, the major portion of the blade being from about 2–4% thick,

each blade being swept at the tip,

said blades having a variable pitch,

a large diameter hub on which said blades are mounted for pitch changes,

a large diameter spinner surrounding the hub, and

a nacelle back of the spinner and forming an extension thereof, said spinner and nacelle being contoured to produce a subsonic flow of air between the blades adjacent the bases thereof.

4,171,184

ROTOR BLADE FOR A GAS TURBINE ENGINE

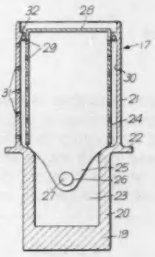
Barry W. Lings, Spondon, and Anthony G. Gale, Wollaton, both of England, assignors to Rolls-Royce Limited, London, England

Filed Apr. 18, 1978, Ser. No. 898,215

Claims priority, application United Kingdom, May 5, 1977, 18878/77

Int. Cl.[2] F01D *5/18*

U.S. Cl. 416—97 R **4 Claims**



1. A rotor blade for a gas turbine engine comprising:

a root portion;

a hollow aerofoil portion supported from said root portion and having an outer open end;

an air entry tube having at least one closed end, said air entry tube being inserted through the open end of said aerofoil portion and mounted within the hollow interior thereof with its closed end positioned adjacent the outer open end of said aerofoil portion;

securing means for mounting said air entry tube within the hollow interior of said aerofoil portion;

means defining a tapering gap between the hollow interior of said aerofoil portion and the outside surface of said air entry tube, said tapering gap reducing in size toward the tip of the blade and being positioned adjacent the outer open end of said aerofoil portion and the closed end of said air entry tube;

and sealing and dampening means cooperating with said tapering gap to seal the air entry tube to the hollow interior of said aerofoil portion and to close off the open end of said aerofoil portion adjacent the closed end of said air entry tube, said sealing and dampening means including a malleable wire bent to a shape closely conforming with said air entry tube's exterior and with the hollow interior of said aerofoil portion, said malleable wire being forced into said gap by centrifugal forces on said blade when said blade is in operation.

4,171,185

SONIC PUMP OFF DETECTOR

Billy J. Duke, and William H. Meister, both of Odessa, Tex., assignors to Operational Devices, Inc., Odessa, Tex.

Filed Jun. 19, 1978, Ser. No. 916,865

Int. Cl.[2] F04B *49/00*

U.S. Cl. 417—12 **11 Claims**

1. The method of determining pump off and pump failure of an oil well having

a. a pump jack cyclically reciprocating

b. a sucker rod connected to

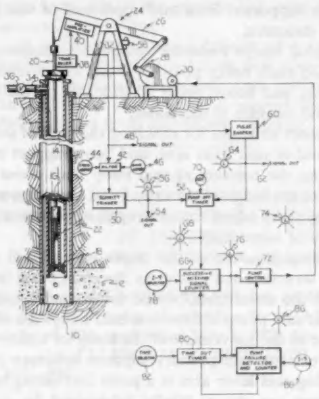
c. a traveling valve below the surface of the earth with

d. a bottom hole valve below the traveling valve,

e. said valves producing sonic clicks when operating;

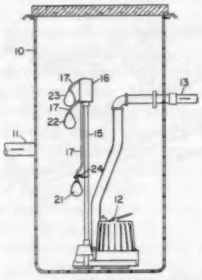
comprising the steps of

f. producing an electrical click signal above ground responsive to the clicks of the valve,



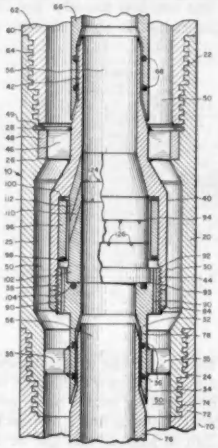
g. establishing a critical portion of each cycle of sucker rod reciprocation, and
h. determining if the click signals are in the critical portion.

4,171,186
SUBMERGED PUMP CONTROL
Floyd A. Chapman, Portland, Oreg., assignor to Hydronix, Inc., Portland, Oreg.
Filed Aug. 12, 1977, Ser. No. 824,169
Int. Cl.[2] F04B *49/04*
U.S. Cl. 417—17 **1 Claim**



1. An electric motor driven pump unit for use in the bottom of a tank, comprising a tubular column connected at its lower end to said unit, a housing on the upper end of said column containing a solenoid actuated mechanical relay for energizing said motor, said relay being encapsulated in electrical insulating resin in said housing, top and middle floats each connected to said housing by a short flexible tube, a bottom float connected to said housing by a long flexible tube, the lower end of said long tube being connected to said column, a mercury switch encapsulated in each of said floats, and an alarm, the switch in said middle float being connected to said relay to start said pump in response to the rising of said middle float, the switch in said top float being connected to said alarm to actuate the alarm in response to the rising of the top float and turn off the alarm in response to the lowering of the top float, and the switch in said bottom float being connected to said relay to stop said pump in response to the lowering of said bottom float.

4,171,187
AIR INJECTION SUB
Thomas C. Reed, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.
Filed Jul. 28, 1977, Ser. No. 819,713
Int. Cl.[2] F04F *5/46; E21B 21/00*
U.S. Cl. 417—170 **14 Claims**

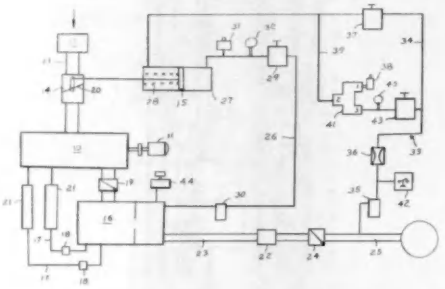


14. In an injection sub for use with dual conduit drill pipe, said sub including concentric tubular elements defining a central passageway and a concentric annular passageway, and injection means for passing fluid from the annular to the central passageway, the improvement comprising:
a plurality of detachable coaxially stacked annular injection rings included in the injection means, said rings defining apertures for injecting fluid into the central passageway, each of said rings defining an inner surface which forms a portion of the perimeter of the central passageway and two transverse surfaces, wherein at least two mating transverse surfaces are sloped with respect to the inner surface in order to coaxially position the rings when the rings are assembled in the injection sub.

4,171,188
ROTARY AIR COMPRESSORS WITH INTAKE VALVE CONTROL AND LUBRICATION SYSTEM
Donald F. Anderson, and Harold J. Albright, both of Franklin, Pa., assignors to Chicago Pneumatic Tool Company, New York, N.Y.
Continuation of Ser. No. 711,399, Aug. 3, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,706
Int. Cl.[2] F04B *49/02*
U.S. Cl. 417—282 **1 Claim**

1. A rotary air compressor system including a motor driven rotary air compressor, an air inlet passage to the compressor, an air receiver connected with the compressor having an oil sump at its bottom, an oil conduit connecting the sump with the compressor, a butterfly intake valve in the inlet passage controlling inlet flow into the compressor having a normally closed condition and provided with a small hole for admitting a restricted flow of inlet air to the compressor while the intake valve is closed, the compressor upon rotating at start-up creating a suction effect over the oil conduit and causing a partial vacuum condition to develop in the compressor because of the closed condition of the intake valve whereby a strong suction force developing in the compressor draws oil from the sump over the oil conduit into the compressor, a piston attached to the intake valve, a biased spring acting upon the piston to draw the valve to a closed condition in the inlet passage, a minimum pressure valve arranged in a discharge passage connecting the

receiver with a demand service line, said minimum pressure valve maintaining said discharge passage closed until a predetermined pressure rises in the receiver, said piston being operable in a cylinder, a butt end of the cylinder being connected by a first control conduit with the receiver to pass receiver air to the cylinder to move the piston against the bias of the spring to open the intake valve, the other end of the cylinder being connected by a second conduit to the service line to receive



pressure air from the service line to supplement the bias of the spring to move the piston to draw the intake valve in a closing direction, pressure regulating means being connected in each of the first and second conduits, and a by-pass line is connected in the second conduit to pass service line air around the pressure regulating means and directly to the piston cylinder to supplement the bias of the spring to force the piston to close the intake valve.

4,171,189

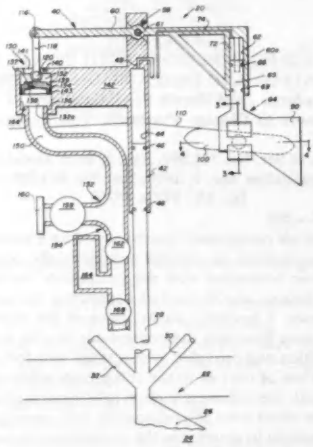
LIFT-FORCE PUMP ACTIVATED BY THE WEIGHT AND BUOYANCY OF GIANT BUOYS

Gus Schreiber, 1430 Medical Arts Bldg., Dallas, Tex. 75201

Continuation of Ser. No. 752,980, Dec. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 652,745, Jan. 27, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 919,380

Int. Cl.[2] F04B *17/00*

U.S. Cl. 417—332 **1 Claim**



1. An apparatus for converting the motion of waves in a body of water to a usable form, comprising:

a primary support structure having a longitudinal axis therethrough with the lower end secured in the body of water and the opposite upper end rotatable about the longitudinal axis and translatable along the longitudinal axis on the lower end,

a lever arm having a longitudinal axis therethrough and pivotally supported from said upper end of said primary support structure,

a plurality of buoys fixed for rotatable engagement on a shaft, said shaft being pivotally fixed to one end of said lever arm, said buoys being positionable on the body of water and buoyant in the water,

a buoy support structure for attaching the shaft of said buoys to one end of said lever arm, said buoy support structure permitting the rotation of said buoy shaft about an axis parallel to the longitudinal axis of said lever arm such that said buoys may adjust to the irregularity of the motion of the body of water, and

a force pump attached to the upper end of said primary support structure and driven by the end of said lever arm opposite the attachment of said lever arm to said buoys such that said pump is driven as said buoys are moved in response to the movement of the body of water to pivot said lever arm, said primary support structure pivotally supporting said lever arm at a point therealong such that said buoys are almost totally submerged by ascending waves before a sufficient buoyancy force is achieved to pivot said lever arm on said support structure and actuate said pump.

4,171,190

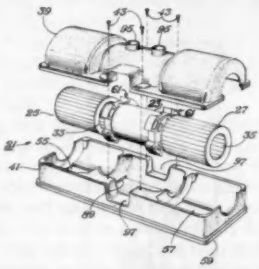
BLOWER MOTOR MOUNTING ASSEMBLY

James N. Hudson, Fort Worth, Tex., assignor to Molded Products Company, Fort Worth, Tex.

Continuation of Ser. No. 730,858, Nov. 8, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 896,085

Int. Cl.[2] H02K *5/24*

U.S. Cl. 417—350 **3 Claims**



1. A blower assembly comprising:

a. a blower housing having a longitudinal axis and made up of a top section and a bottom section which fit together generally in a plane parallel to said longitudinal axis;

b. a motor having shaft portions extending from opposite ends thereof, with a blower attached to each shaft portion, and a motor housing having a generally cylindrical portion coaxial with said shaft portions and end walls integral with the cylindrical portion and disposed generally transversely of said shaft portions;

c. an end support attached to each end wall of said motor housing for supporting said motor and blowers in said blower housing, each end support comprising:

i. a body portion having a generally cylindrical portion disposed coaxially with a respective said motor shaft portion and an end wall disposed generally transversely of said motor shaft portion,

ii. said body portion further having a concavity formed by interior surfaces of said cylindrical portion and said respective end wall, with said concavity shaped to

conformingly fit the corresponding cylindrical portions and end walls of said motor housing,

iii. resilient support leg means integral with the cylindrical portion of said body portion and extending radially outwardly therefrom,

iv. said end supports being formed of a relatively soft flexible material and sized such that when said blower housing sections are joined, said end supports are clamped thereby to resiliently support said motor and blowers away from said blower housing.

4,171,191

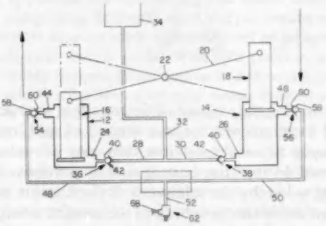
APPARATUS FOR TRANSFERRING METERED QUANTITIES OF MATERIAL FROM ONE LOCATION TO ANOTHER

Wallace F. Krueger, 4401 Merriweather Rd., Toledo, Ohio 43623

Continuation-in-part of Ser. No. 815,527, Jul. 14, 1977, Pat. No. 4,118,799, which is a continuation of Ser. No. 670,137, Mar. 25, 1976, abandoned. This application May 1, 1978, Ser. No. 901,689

Int. Cl.[2] **F04B** *21/00;* **G05D** *11/00*

U.S. Cl. 417—539 **6 Claims**



1. Apparatus for metering viscous material comprising means for establishing a source of material at positive pressure above atmospheric pressure, an outlet where the material is at a higher pressure, a first cylinder having a first ram reciprocable therein, first inlet means connecting said source of positive pressure material with said first cylinder, said first inlet means having first check valve means enabling flow of the material only toward said first cylinder, first outlet means connecting said first cylinder with said outlet, said first outlet means having second check valve means enabling flow of the material only away from said first cylinder, a second cylinder having a second ram reciprocable therein, second inlet means connecting said source of positive pressure material with said second cylinder, said second inlet means having third check valve means enabling flow of the material only toward said second cylinder, second outlet means connecting said second cylinder with said outlet, said second outlet means having fourth check valve means enabling flow of material only away from said second cylinder, an adjustable back-pressure valve through which the metered material must flow for establishing an adjustable back pressure of the metered material at said outlet, and means for reciprocating said first and second rams in said first and second cylinders.

4,171,192

ECCENTRIC POSITIONING MEANS FOR A REVERSIBLE PUMP

David H. Taylor, Bloomington; Hendrie J. Grant, St. Paul, and Lawrence J. Shirek, Minneapolis, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

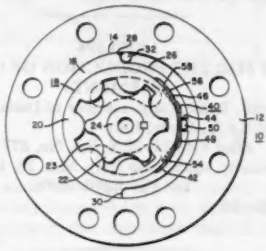
Filed May 5, 1978, Ser. No. 903,374

Int. Cl.[2] **F04C** *1/06, 15/04;* **F16D** *7/02*

U.S. Cl. 418—32 **7 Claims**

1. Means for frictionally engaging the cylindrical lubricated surface of a rotating cylindrical member and positively drivingly engaging an adjacent annular collar member encircling said cylindrical member to transmit rotation of said cylindrical member to said collar member and wherein said collar member is moved thereby to either one of two positions in response to continuous rotation of the cylindrical member, said means comprising:

at least one generally flat arm resiliently urged into facing engagement with said cylindrical surface adjacent one end and positively retained within said collar member at an opposite end and wherein said one end extends generally tangentially on either side of said engagement to define a



pair of opposed wedge-shaped confined spaces between said cylindrical surface and said flat arm whereby lubricating fluid on the surface of said cylindrical member is forced into either of said wedge-shaped spaces, dependent upon the direction of relative rotation between said cylindrical member and said arm, to force a film of lubricant between said arm and said surface to eliminate intimate contact therebetween during the continuous rotation of said cylindrical member.

4,171,193

APPARATUS FOR THE PRODUCTION OF SHAPED STRANDS OF THERMOPLASTIC SYNTHETIC-RESIN MATERIAL

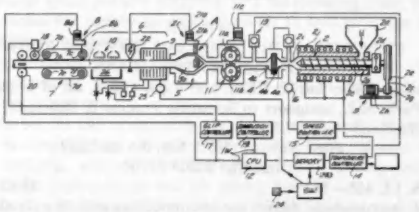
Herbert K. Rahlfs, Troisdorf-Sieglar, Fed. Rep. of Germany, assignor to Reifenhauser KG, Troisdorf, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,502

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700003

Int. Cl.[2] **B29D** *23/04*

U.S. Cl. 425—71 **10 Claims**



1. An apparatus for producing continuous extrusions having predetermined desired product data from a thermoplastic synthetic resin, comprising:

an extrusion press provided with a speed controller for extruding a thermoplastified stream of synthetic-resin material;

a metering pump downstream of said extruder for displacing said thermoplastified material at a rate dependent upon the speed of said pump;

an extrusion die downstream of said pump and traversed by said material to form said extrusion;

a withdrawal device downstream of said die for drawing the extrusion away from said die;

first control means operatively associated with said extruder for regulating the speed of said extruder;

second control means operatively associated with said pump for regulating the speed of pump;

third control means operatively associated with said withdrawal device for regulating the speed of said withdrawal device; and

a computer means storing the desired product data and controlling said second control means, said withdrawal device being controlled at least in part in dependence upon the speed of said pump.

4,171,194

PLANT FOR THE PRODUCTION OF CONCRETE ELEMENTS

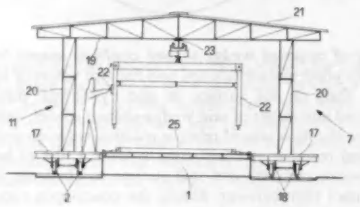
Cesare Goretti, Rome, Italy, assignor to Italiana Prefabbricazione Edile S.p.A., Rome, Italy

Filed Feb. 14, 1978, Ser. No. 877,734

Claims priority, application Italy, Mar. 25, 1977, 48656 A/77

Int. Cl.[2] B28B *15/00*

U.S. Cl. 425—88 **10 Claims**



1. A plant for the production of prefabricated concrete structural units comprising: a longitudinally extending track having a horizontal upper surface; a plurality of transverse walls spaced apart longitudinally along the track and a plurality of transversely spaced apart longitudinal walls, said transverse and longitudinal walls being connected to the track in a manner to form with the upper surface of the track a plurality of stationary molds arranged along the track; a train of cars movable stepwise along the plurality of molds; equipment mounted on each car to perform on the molds at least one operation of a casting cycle; and roofing on the cars extending over the molds to protect the casting cycle operations from the weather.

4,171,195

CROSS-HEAD DIE WITH VOLUMETRIC FLOW COMPENSATION MEANS

Reuben Klein; Imrich Klein, and Yigal Cidon, all of Highland Park, N.J., assignors to Scientific Process & Research, Inc., Highland Park, N.J.

Filed Nov. 17, 1977, Ser. No. 852,228

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—141 **14 Claims**

1. A cross-head die for use in connection with an extruder to receive material from the extruder and direct the material into a downstream flow wherein the material is conformed to an annular configuration of desired wall thickness, said cross-head die comprising:

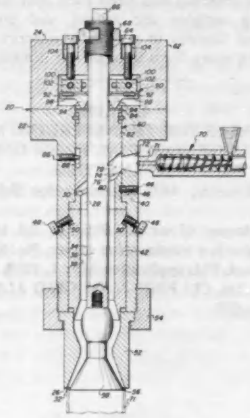
a housing;

an annular die passage extending axially within the housing, the die passage having an annular inlet, and an outlet axially downstream of the inlet;

an input passage in the housing, the input passage extending transverse to the direction of the die passage for receiving the material from the extruder and passing the material toward the die passage;

a manifold in the housing, the manifold communicating with the input passage and having an annular outlet juxtaposed with the annular inlet of the die passage, the manifold further having a given volume at locations along the manifold, the locations communicating with corresponding circumferential portions of the annular inlet of the die passage; and

means operatively associated with the manifold for selectively varying the volume of the manifold at at least a first of said locations relative to a second of said locations to selectively adjust the relative flow rate of material from the manifold into the corresponding portions of the die passage, whereby the relative wall thickness is selectively adjusted about the periphery of the annular configuration.



4,171,196

SCREW-TYPE PLASTICS EXTRUDER

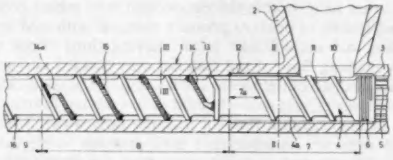
Charles Maillefer, St. Sulpice, Switzerland, assignor to Maillefer S.A., Ecublens, Switzerland

Filed Oct. 16, 1978, Ser. No. 951,787

Claims priority, application Switzerland, Oct. 25, 1977, 12975/77

Int. Cl.[2] B29F *3/02*

U.S. Cl. 425—209 **13 Claims**

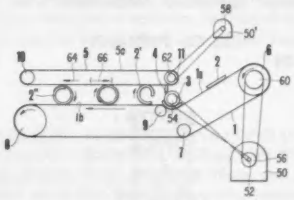


1. A high-output screw-type extruder for plastic materials comprising a cylinder and a screw housed within said cylinder, driven rotatingly about its axis at a predetermined speed, and divided along its length into at least three successive zones including a feed zone, a plasticizing zone, and a homogenization zone, wherein said cylinder or said screw or both are formed in said feed zone in such a way as to overfeed said plasticizing zone; wherein, in said plasticizing zone, the cylindrical inner surface of said cylinder is smooth, and said screw has two spiral threads defining, together with the hub of said screw and said cylinder, an entrance channel of decreasing cross-section and an exit channel of increasing cross-section, conducting said plastic material toward the exit of said extruder and separated by one of said two threads; and wherein this thread is crossed by a series of narrow passages connecting its downstream side to its upstream side.

4,171,197
APPARATUS FOR CONTINUOUSLY ROLLING UP SHEETS OF BAKED COOKIES

Fumio Sato, Zami, Japan, assignor to Morinaga and Company, Ltd., Japan

Filed Dec. 16, 1977, Ser. No. 861,298
Claims priority, application Japan, Dec. 30, 1976, 51/160098
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.[2] A21C *3/06*
U.S. Cl. 425—321 **5 Claims**



1. An apparatus for forming rolled sheet articles such as cookies, comprising first endless conveyor means including an oblique article support surface portion and an adjacent substantially horizontal article support surface portion, a rolling up roller rotatably mounted for rotation at a slower speed than the speed of said first endless conveyor means located adjacent the juncture of said oblique article support surface portion and said horizontal article support surface portion, in a position to deflect an article thereon into a path around its periphery to begin forming it into a roll, a stop disposed alongside said rolling up roller to stop the movement of the article around said roller and to permit it to move along said horizontal article support surface portion, and a rolling up belt conveyor having a portion substantially parallel to said horizontal article support surface portion and spaced therefrom by an amount to engage the partially rolled article, and being moveable at a speed and in a direction to cause the continued forming of the article into a roll, and drive means connected to said first endless conveyor means, said rolling up roller, and said rolling up belt conveyor to drive them.

4,171,198
MATERIAL EXTRUDING APPARATUS

James A. Jimenez, Temple City, Calif.; Alfred A. Aguirre, 15353 Hayford St., La Mirada, Calif. 90638, and Apolonio Reyes, 6209 Here Ford Dr., Los Angeles, Calif. 90022, assignors to Alfred A. Aguirre and Apolonio Reyes, both of Norwalk, Calif.

Filed Aug. 31, 1977, Ser. No. 829,292
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—377 **11 Claims**

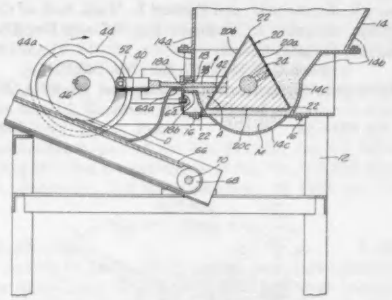
1. A material extruding apparatus for extruding pliant material into a relatively thin, continuous sheet comprising:

(a) a material receiving hopper having spaced apart side walls one of which has an elongated slot formed therein;

(b) a barrier member having a thickness less than the width of the slot in said side wall and extending from outside said hopper through said slot into said hopper; said member having an edge portion disposed within said hopper;

(c) material moving means rotatably mounted within said hopper in cooperative association with said barrier member, for moving the material within the hopper into compressive engagement with the portion of said barrier member disposed within said hopper, said material moving means comprising an elongated rotor having a plurality of interconnected side walls; and

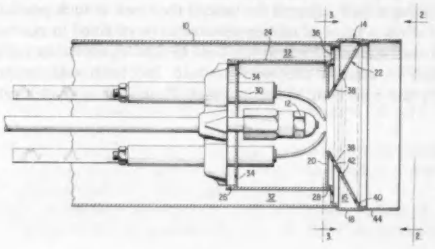
(d) means interconnected with said barrier member for reciprocating said member within said slot relative to said rotor so that as said rotor rotates, said internal edge portion of said barrier member will be continuously maintained in close proximity with said side walls of said material moving means without touching same whereby a substantial majority of the material moved into compressive engagement with said barrier member will be extruded from said hopper through the slot in said side wall to form a relatively thin continuous sheet of material.



4,171,199
FRUSTOCONICAL BURNER CAN ASSEMBLY

Joseph Henriques, 24 Hidden Brook Dr., Brookfield, Conn. 06804

Filed Sep. 27, 1977, Ser. No. 837,215
Int. Cl.[2] F23D *15/00*
U.S. Cl. 431—351 **9 Claims**



1. In a gun type burner having a fuel injector for discharging a conical spray pattern centrally of a surrounding blast tube and means for supplying pressurized air to said tube, the improvement comprising;

a perforated, frustoconical burner can surrounding, and concentric with, the downstream end of said injector spray pattern;

said burner can comprising the downstream wall of a preheating plenum chamber surrounding said injector for defining, with said conical spray pattern, a rotationally static frustoconical fuel/air mixing zone;

said plenum chamber including a plurality of upstream inlet passages for admitting substantially the entire air flow through said blast tube to said plenum chamber and whose aggregate cross-section exceeds that of the burner can perforations;

means for directing substantially the entire flow of air in said blast tube through said upstream passages;

said burner can perforations being symmetrically disposed about the burner can axis;

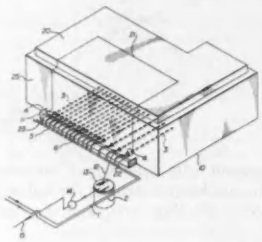
and said frustoconical burner can exhibiting a perforated to non-perforated surface area ratio decreasing from a maximal adjacent the smaller upstream end thereof to a minimal adjacent the downstream end thereof and then increasing, at the extreme downstream end thereof, to a value intermediate said maximal and minimal ratios.

4,171,200

PROCESS AND APPARATUS FOR IN SITU MELTING OF SULPHUR FROM SOLID SULPHUR STORAGE BLOCK

Richard F. Jagodzinski, and Edward L. Wahl, both of Calgary, Canada, assignors to Hudson's Bay Oil and Gas Company Limited, Calgary, Canada

Filed Oct. 31, 1977, Ser. No. 846,833
Claims priority, application Canada, Nov. 15, 1976, 265637
Int. Cl.[2] F27B *17/00*
U.S. Cl. 432—13 18 Claims



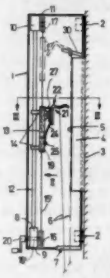
1. A method for the in situ melting and recovery of sulphur from a free standing solid block of stored sulphur having a generally horizontal base, which comprises drilling a series of generally horizontal bores adjacent the base of the block and inserting a series of elongated heat exchange elements into said bores to provide a generally horizontal array of said elements, providing a weir adjacent the base of the block in such position as to allow a layer of molten sulphur to be retained in contact with said elements, supplying heat to said elements to cause sulphur in contact therewith to melt and form said molten layer, and removing molten sulphur from said weir at a rate sufficient to maintain said molten layer in contact with said elements.

4,171,201

APPARATUS FOR THREADING UP AND PLACING A THERMOPLASTIC THREAD ON A HEATING DEVICE OF A TEXTILE MACHINE

Jakob Fluck, Winterthur, and Eduard Schenkel, Seuzach, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 21, 1977, Ser. No. 844,302
Claims priority, application Switzerland, Oct. 28, 1976, 13581/76
Int. Cl.[2] F27B *9/28*
U.S. Cl. 432—59 18 Claims



15. A thread guide element for transfering thread comprising a wire like element having a pair of parallel legs each having adjacent leg portions defining a guide surface for holding a thread thereon and a loop interconnecting said legs at one end and extending away from said legs in a direction opposite to said guide surface.

4,171,202

SHEET CONTAINING SUBLIMABLE DYE AND BLOCKING REAGENT FOR HEAT TRANSFER PRINTING

Carl E. Sideman, Lunenburg, and Thomas E. Lewis, Gardner, both of Mass., assignors to Litton Business Systems, Inc., Fitchburg, Mass.

Filed Dec. 16, 1977, Ser. No. 861,422
Int. Cl.[2] D06P *5/00, 5/06*
U.S. Cl. 8—2.5 A **16 Claims**

1. A structure useful for heat transfer dye printing which comprises a substrate, at least one heat transferable dye on one surface of said substrate and a blocking agent deposited on or below at least a portion of said dye, said blocking agent being chemically reactive with at least one of said heat transferable dyes.

4,171,203

HAIR DYE COMPOSITIONS CONTAINING 3,5-DIAMINO-2-SUBSTITUTED-ALKYLBENZENES

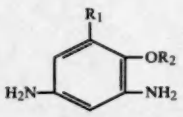
David Rose, Hilden; Erwin Weinrich, Haan, and Edgar Lieske, Dudseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 20, 1977, Ser. No. 807,972
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1976, 2628999
Int. Cl.[2] A61K *7/13;* **C07C** *91/42, 93/14*
U.S. Cl. 8—10.2 **20 Claims**

1. An aqueous preparation of the developer-coupler type for the dyeing of hair, consisting essentially of

(a) 0.2 to 5% by weight of a developer-coupler comtination of, as a coupler,

(A) a 3,5-diamino-2-substituted alkyl benzene of the formula



wherein R_1 is a straight- or branched-chain alkyl of 1 to 8 carbon atoms and R_2 is a member selected from the group consisting of a straight- or branched-chain alkyl radical of 1 to 8 carbon atoms, phenyl, and phenyl substituted by a member selected from the group consisting of alkyl radicals of 1 to 4 carbon atoms and halogen atoms, or

(B) a water-soluble acid addition salt of (A), and a conventional developer therefor, said coupler and said developer being present in the molar range of about 2:1 to 1:2;

(b) 0% to 30% by weight of a surfactant;

(c) 0% to 25% by weight of a thickener; and

(d) the remainder water.

4,171,204

PRECIPITATION OF PROTEIN

Kathryn S. Schwenzer, Gurnee, and Susan E. Magic, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 1, 1978, Ser. No. 939,016
Int. Cl.[2] G01N *31/02, 33/161*
U.S. Cl. 23—230 B **4 Claims**

1. In a method for analyzing blood serum or plasma wherein the blood serum or plasma is treated with an organic solvent to precipitate proteins and provide a supernatant followed by separating the supernatant and measuring a component in the supernatant, the improvement comprising treating a volume of blood plasma or serum with about 1.4 or more volumes of acetonitrile, propionitrile, tetrahydrofuran, or mixtures thereof to precipitate proteins.

4,171,205

PROCESS FOR OBTAINING AN ALUMINUM SULFATE HYDRATE FROM AN IMPURE SULFURIC ACID SOLUTION OF ALUMINUM SULFATE

Jean M. Laménant; Joseph Cohen, both of Aix-en-Provence, and Pierre Maurel, Gardanne, all of France, assignors to Aluminium Pechiney, Lyons, France

Continuation-in-part of Ser. No. 917,067, Jun. 19, 1978, abandoned, which is a continuation of Ser. No. 733,855, Oct. 19, 1976, abandoned. This application Dec. 28, 1978, Ser. No. 973,932
Int. Cl.[2] B01D *9/02*
U.S. Cl. 23—296 **7 Claims**

1. A process for precipitating an acid aluminum sulfate of the formula $Al_2(SO_4)_3.0.5H_2SO_4.11$ to $12H_2O$ from an initial solution resulting from the treatment of an aluminous material with a sulfuric acid solution and containing aluminum sulfate hydrate as a result of the treatment, comprising the steps of sequentially treating the initial solution in a series of crystallizers in cascade relation by:

(a) heating the initial solution in a first crystallizer vessel to establish a state of supersaturation of aluminum acid sulfate and wherein the composition of the solution within a triangle defined graphically by an abscissae denoting the percentage of free H_2SO_4 and an ordinate denoting a percentage of sulfates of aluminum expressed as Al_2O_3, wherein the triangle ABC whose vertex A represents precipitated aluminum sulfate has an abscissae of about 17% by weight and an ordinate of about 8% by weight and vertices B and C have abscissae of about 39% and about 56% respectively and ordinates of about 1% and about 0.5% by weight respectively;

(b) maintaining the first crystallizer at a temperature at most equal to about 80° C. for a solution residence time sufficient to provide a suspension that has generally reached a state of static equilibrium of precipitation of said acid aluminum sulfate;

(c) cascading the suspension to at least a second crystallizer maintained at a temperature lower than that of a preceding crystallizer and repeating step (b); and

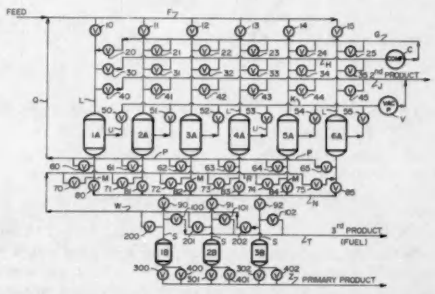
(d) recovering precipitated acid aluminum sulfate of the formula $Al_2(SO_4)_3.0.5H_2SO_4.11$ to $12H_2O$ as product.

4,171,206

SEPARATION OF MULTICOMPONENT GAS MIXTURES

Shivaji Sircar, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 21, 1978, Ser. No. 935,435
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—26 **27 Claims**



1. In the separation of a multicomponent feed gas mixture with the individual recovery of a primary key component and

a secondary key component present in such mixture, by selective sorption, wherein said secondary key component is more strongly sorbed than the primary key component and there is present in said mixture at least one minor dilute tertiary gas component less strongly sorbed than the secondary key component; the method which comprises, in an adiabatic adsorption pressure swing cycle the steps of:

(a) passing such multicomponent gas mixture at initial superatmospheric pressure and in selected flow direction through a first sorbent bed (A) selective for preferential retention of said secondary key component and then passing the effluent from said first bed through a second sorbent bed (B) selective for retention of said tertiary component(s) as opposed to said primary key component, and discharging from said second sorbent bed unadsorbed primary key component, said passing of the multicomponent gas mixture being continued for a controlled time period until or short of breakthrough of said secondary key component from said first sorbent bed, while retaining all of the said tertiary components in said second sorbent bed;

(b) thereafter discontinuing gas flow communication between said first and second sorbent beds, and

(i) rinsing said first bed by flowing a stream of relatively pure secondary key component therethrough at substantially the initial feed pressure level for a controlled time period effective to purge most of the void and displaced gases from the said first bed, and during this time period (b),

(ii) lowering the pressure in said second bed to an intermediate level by withdrawing a gas stream therefrom including void and desorbed gases, and thereafter;

(iii) further depressuring said second bed to near ambient pressure followed by;

(iv) purging the second bed at near ambient pressure with a stream of primary key component;

(c) after said rinsing step in (b) above reducing the pressure in said first bed to an intermediate level by desorption of gas therefrom including previously sorbed secondary key component and during this step (c), repressuring the second bed to an immediate pressure level by flow thereinto of gas essentially free of the secondary key component;

(d) following step (c) above further desorbing gas from said first bed to lower the pressure therein to substantially ambient level, and thereafter;

(e) evacuating said first bed to subatmospheric level;

(f) after attaining the subatmospheric level in the said first bed, introducing thereinto a gas stream substantially free of the secondary key component to bring said first bed to an intermediate pressure level, and thereafter;

(g) further repressurizing said first bed to initial superatmospheric feed pressure level by flowing thereinto primary key product gas via a second bed already pressurized to the intermediate pressure level (step c), thereby bringing both beds to the feed pressure level and making them ready to repeat the defined sequence of steps beginning with the reintroduction of the multicomponent feed gas mixture into the said first sorbent bed.

4,171,207

SEPARATION OF MULTICOMPONENT GAS MIXTURES BY PRESSURE SWING ADSORPTION

Shivaji Sircar, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 21, 1978, Ser. No. 935,424

Int. Cl.[2] **B01D** *53/04*

U.S. Cl. 55—26 **22 Claims**

1. In the separation of a multicomponent feed gas mixture in a system comprising a plurality of first and second sorbent beds, with the individual recovery of a primary key component and a secondary key component present in such mixture, by selective sorption, wherein said secondary key component is more strongly sorbed by the sorbent employed than the primary key component and there is present in said mixture at least one other tertiary gas component, which is present in dilute concentrations and which is more strongly sorbed than both the primary key and the secondary key component; the method which comprises in an adiabatic pressure swing cycle the sequential steps of

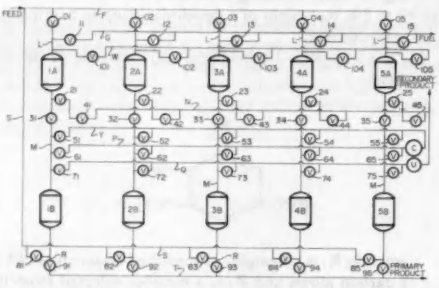
(a) an adsorption step during which such multicomponent feed gas mixture at initial superatmospheric pressure is passed through a first sorbent bed selective for preferential retention of tertiary gas component(s) and then through a second sorbent bed selective for retention of said secondary key component, and discharging from said second sorbent bed unadsorbed primary key component, said passing of the multicomponent gas mixture being continued for a controlled time period until or short of breakthrough of said secondary key component from said second sorbent bed, while retaining essentially all of the tertiary gas component(s) in said first adsorbent bed;

(b) thereafter interrupting feed gas flow to said first bed and discontinuing gas flow communication between said first and second beds; and

(i) rinsing said second sorbent bed at about initial feed pressure by flowing a stream of essentially pure secondary product gas component therethrough until said second bed is saturated with said secondary component; and meanwhile

(ii) first reducing to an intermediate level the pressure in said first bed by gas withdrawal therefrom, and

(iii) then further reducing the pressure in said first bed to substantially ambient level by further gas withdrawal therefrom, and;



(c) thereafter, reducing the pressure of the said second bed to substantially ambient pressure level by gas withdrawal therefrom comprising substantially pure secondary key component, and during such pressure reduction of said second bed

(i) purging said first bed with part of the gas being withdrawn from said second bed; and

(ii) purging another second bed, which is then undergoing the high pressure rinse step defined in (b), with part of the gas being withdrawn from the first mentioned second bed after compressing the said withdrawn gas to about the initial feed pressure;

(d) following reduction of pressure in said second bed to substantially ambient pressure level, evacuating said bed to lowest pressure in the operating sequence thus further desorbing secondary key component therefrom; and

(e) repressuring the previously evacuated second bed to feed pressure level by flow thereinto of primary product gas and while said second bed is being thus repressured,

(i) first bringing said first bed to an intermediate pressure level by flow thereinto of a gas stream comprising the desorbed gas from another first bed then undergoing the pressure reduction step defined in step (b), and

(ii) then re-establishing flow between said second and first beds and flowing primary product gas through said second bed into said first bed until said first bed is brought to initial feed gas pressure level, and

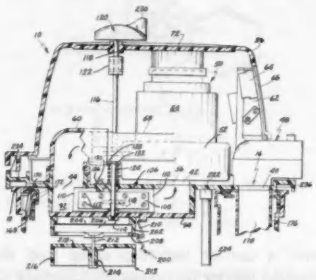
(f) when said first and second beds are at feed gas pressure at the conclusion of step (e) above, repeating the above-recited sequence of operations beginning with step (a) above.

4,171,208

VACUUM CLEANER INCLUDING DIVERTER VALVE

Dale E. Lowder, North Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.

Filed Oct. 3, 1977, Ser. No. 838,564
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—216 **20 Claims**



1. A suction head for a wet/dry vacuum of the type including a collection tank, said suction head comprising:

a base adapted to rest on the collection tank, said base defining a tank inlet aperture, an intake aperture, an exhaust aperture and an atmospheric intake-discharge aperture;

a vacuum means secured to one side of said base for creating a vacuum at said intake aperture, said vacuum means including an intake connected to and communicating with said intake aperture and an exhaust; means connected to said exhaust and said exhaust aperture for communicating said exhaust with said exhaust aperture;

a valve housing defined in part by said base and being integral with said base opposite said vacuum means, said housing defining a tank opening communicating with said tank, said intake aperture, said exhaust aperture and said atmospheric intake-discharge aperture each opening into said valve housing through said base; and

a planar valve element positioned generally vertically within said housing and rotatable between first and second positions within said housing about a vertical axis, said housing and said valve element being dimensioned and said valve element being positionable within said housing so that said intake aperture communicates with said valve housing tank opening and said exhaust aperture communicates with said atmospheric intake-discharge when said valve element is in said first position to draw air into said tank through said tank inlet aperture, and said intake aperture communicates with said atmospheric intake-discharge aperture and said exhaust aperture communicates with said tank opening when said valve element is in said second position to pressurize said tank, said valve element and said housing defining chambers connecting said apertures when said valve element is in said positions.

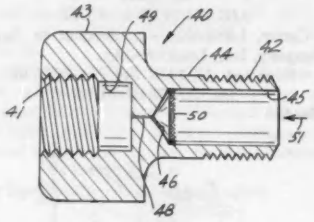
4,171,209

APPARATUS FOR REMOVING CONDENSATE FROM STEAM LINES, AND THE LIKE

Timothy S. Brown, Houston, Tex., assignor to Thermal Con-Serv Corp., Houston, Tex.

Filed Feb. 7, 1977, Ser. No. 765,939
Int. Cl.[2] B01D *46/10;* **F15D** *1/02*
U.S. Cl. 55—466 **22 Claims**

1. Drain orifice apparatus, comprising body means having a flow passage therethrough, plate means unitarily formed with said body means disposed to close said flow passage, an orifice through said plate means communicating between the opposite sides of said plate means for restricted fluid flow therethrough, screen means tightly fitted around its entire outer periphery around the entire interior periphery of the wall of said flow passage in spaced proximity to one side of said plate means for removing detritus which would block said orifice from fluids flowing through said flow passage in a direction through said screen means toward said orifice, a screen supporting shoulder



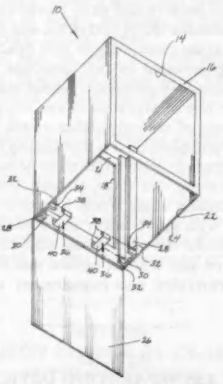
disposed around one end of said orifice between said one end of said orifice and said screen means and against which said screen means is disposed, said screen means being constructed to be passable to against said shoulder through the portion of said flow passage at said one side of said plate means in a direction longitudinal of said flow passage portion, said flow passage portion being of uniform diameter over all of its length between one end of said body means and said screen supporting shoulder and said screen means being of the same diameter.

4,171,210

UNIT FILTER INCLUDING FILTER RETAINING MEANS

Jerry D. Miller, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Nov. 1, 1978, Ser. No. 956,493
Int. Cl.[2] B01D *46/10, 35/12*
U.S. Cl. 55—481 **7 Claims**



1. In a gas filter assembly having a unit filter cell for removing contaminants from a gas stream flowing therethrough; a filter housing for receiving the unit filter cell having a gas inlet opening in one side wall and a gas outlet opening the opposite side wall to form a gas passage through the filter housing and a closable access port in the bottom wall for providing access to the interior of the filter housing through which the unit filter cell is installed and removed; and a pair of spaced apart generally parallel channels disposed within the filter housing and extending longitudinally across the filter housing from the access port on opposite sides of the gas inlet opening, each channel having an open end at the access port, the pair of channels receiving, through their open ends, the opposite

margins of the unit filter cell to hold the unit filter cell in position acrss the gas inlet opening; the improvement comprising;

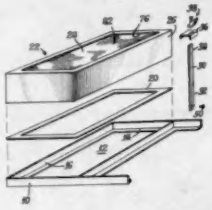
filter cell retaining means removably connected to each channel to prevent the unit filter cell from inadvertently falling out of the filter housing through the access port upon opening of the access port.

4,171,211

AIR FILTERING UNIT

Albert B. Carter, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 13, 1978, Ser. No. 895,746
Int. Cl.[2] B01D *46/10*
U.S. Cl. 55—493 **5 Claims**



1. An air filtering unit including a generally rigid affixed framework having a planar flange defining an opening, a flow-through filter cartridge having a lower edge surface adapted to seat on said flange, and means for securing said filter cartridge in position on said framework with the lower edge of the cartridge in engagement with said framework, said securing means including at least two opposing adjustable fastening means, each said fastening means including an elongated strap having a plurality of equally spaced parallel slots and being attached at its lower end to an outer wall portion of said framework and extending outwardly a distance greater than the height of said filter cartridge, a bracket having an aperture therein which matches the cross-sectional configuration of said strap and is sized to receive said strap therethrough so that said bracket is freely slidable along said strap, and adjustable means mounted on said strap outwardly of said bracket, said adjustable means being movable to two positions relative to said strap such that when said adjustable means is in a first position it engages at least one of said slots of said strap to permit only selective movement of said adjustable means along said strap and when in a second position it is disengaged from said at least one slot of said strap to permit free slidable movement of said adjustable means along said strap, said adjustable means when in said second position being freely movable along said strap into engagement with said bracket and when in said first position being selectively movable along said strap to exert and maintain a force on said bracket against said filter cartridge to urge said filter cartridge into engagement with said framework.

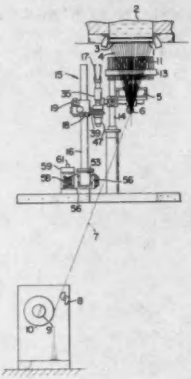
4,171,212

MOLTEN GLASS SEPARATING DEVICE IN GLASS FIBER FORMING APPARATUS

Hiroaki Shono; Koji Nakazawa, and Shinzo Ishikawa, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Aug. 9, 1978, Ser. No. 932,284
Claims priority, application Japan, Aug. 19, 1977, 52-99167
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—11 R **10 Claims**

1. In a glass fiber forming apparatus of the type having an orifice plate with a plurality of closely spaced orifices and a flat undersurface, means for downwardly drawing glass cones formed under said orifices to form into glass fibers, and means for blowing cooling air against the undersurface of said orifice plate, the improvement comprising means for separating a mass of molten glass adhered to the undersurface of said orifice plate in flooding condition into individual glass fibers, said separating means comprising an elongated stationary shaft standing on a floor spaced below said orifice plate at a position out of the stream of glass fibers and extending toward said



orifice plate, a carrier movable along said shaft, means mounted on said carrier for releasably clamping said mass of molten glass, and a drive means for moving up and down said carrier to and from a position which may enable said clamping means to reach said mass of molten glass.

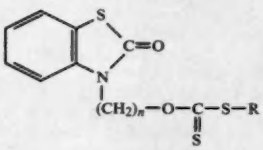
4,171,213

N-SUBSTITUTED OXYBENZOTHIAZOLINE DERIVATIVES AND THEIR USE AS PLANT GROWTH REGULANTS

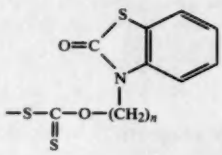
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 18, 1978, Ser. No. 907,390
Int. Cl.[2] C07D *277/62;* **A01N** *9/12*
U.S. Cl. 71—90 **12 Claims**

1. A compound of the formula



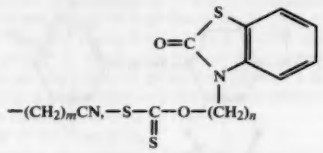
wherein R is selected from the group consisting of $-(CH_2)_mCN$,



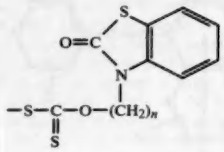
and potassium and sodium cations;

n is an integer of from 1 to 2; and m is an integer of from 1 to 2.

5. A method of influencing the growth of leguminous plants which method comprises applying to said leguminous plants or their habitat an effective plant growth regulating amount of a compound of the formula



wherein R is selected from the group consisting of $-(CH_2)_mCN$,



and potassium and sodium cations; n is an integer of from 1 to 2; and m is an integer of from 1 to 2.

4,171,214

PYRAZINE-2-YLMETHYL-KETONES AND THEIR FUNGICIDAL USE

Sugavanam Balasubramanyan, Wokingham, and Margaret C. Shephard, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

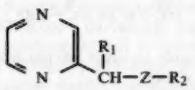
Filed Dec. 19, 1977, Ser. No. 862,299

Claims priority, application United Kingdom, Jan. 6, 1977, 359/77

Int. Cl.[2] **C07D** *241/12;* **A61K** *31/495;* **A01N** *9/22*

U.S. Cl. 71—92 **7 Claims**

1. A pyrazine compound having the formula:



wherein Z is C=O; R_1 is hydrogen, allyl, C_1 to C_4 alkyl, phenyl, benzyl, phenoxy, nitrobenzyl, mono- or -di, fluoro- or chloro-, -benzyl or -phenoxy; R_2 is C_1 to C_4 alkyl, phenyl, or halophenyl; and and acid-addition salts thereof.

3. A method for combating fungal or bacterial diseases in plants which comprises treating the plant, seed of the plant, or the locus surrounding the seed or plant with a pyrazine compound as claimed in claim **1**.

5. A method of regulating the growth of a plant, which method comprises applying to the plant, to seed of the plant, or to the locus of the plant or seed, a compound as claimed in claim **1**.

4,171,215

ALLOYING ADDITION FOR ALLOYING MANGANESE TO ALUMINUM

Charles E. Dremann, Phoenixville, Pa., assignor to Foote Mineral Company, Exton, Pa.

Filed Jul. 3, 1978, Ser. No. 921,166

Int. Cl.[2] **C22C** *22/00;* **B22D** *23/08*

U.S. Cl. 75—0.5 B **10 Claims**

1. An alloying addition for alloying manganese with aluminum which comprises a mixture of finely divided particles of aluminum and beta manganese, said beta manganese being present as manganese metal or in the form of a manganese-aluminum alloy comprising from about 75 to about 98 percent, by weight, manganese, said alloying addition comprising from about 50 to about 90 percent, by weight, of beta manganese and from about 10 to about 50 percent aluminum, at least about 10 percent by weight of the total composition comprising aluminum powder.

4,171,216

PROCESS FOR REFINING NON-FERROUS MATTE

Pierre J. Leroy, St. Germain en Laye, France, assignor to Creusot-Loire, Paris, France

Filed Apr. 24, 1978, Ser. No. 899,257

Claims priority, application France, Apr. 25, 1977, 77 12455

Int. Cl.[2] **C22B** *15/06*

U.S. Cl. 75—76 **8 Claims**

1. In a process for refining molten non-ferrous matte by injecting an oxidizing gas into said matte through at least one multiple, concentric tube tuyere submerged beneath the surface of said matte, while also injecting a cooling agent through the outermost tube of said tuyere, the improvement comprising:

injecting liquid sulfur as said cooling agent.

4,171,217

CORROSION-RESISTANT NICKEL ALLOY

Aziz I. Asphahani; F. Galen Hodge; Robert B. Leonard, and Patrick D. Schuur, all of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Feb. 21, 1978, Ser. No. 879,561

Int. Cl.[2] **C22C** *19/05*

U.S. Cl. 75—122 **8 Claims**

1. An alloy resistant to hydrogen cracking and sulfide and chloride stress cracking consisting, essentially, of, in weight percent, up to 5% cobalt, 17 to 23% chromium, 8 to 10% molybdenum, up to 3% tungsten, 15 to 22% iron, not over 1% silicon, not over 1% manganese, 0.040% maximum phosphorus, 0.030% maximum sulfur, 0.030% maximum carbon and the balance nickel and incidental impurities.

4,171,218

ANTICORROSIVE BELLOWS

Taiji Hoshino, Tokyo; Masao Okubo, and Masayoshi Miki, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 18, 1978, Ser. No. 907,345

Claims priority, application Japan, May 23, 1977, 52/60266

Int. Cl.[2] **F16J** *3/04;* **C22C** *38/02, 38/48, 38/50*

U.S. Cl. 75—128 C **3 Claims**

1. An anticorrosive bellows made of stainless steel consisting essentially of 0.10% by weight or less of C, 2.5–5% by weight of Si, 2% by weight or less of Mn, 15–20% by weight of Cr, 10–22% by weight of Ni, 10 times or more as much as the C content but at most 2.5% by weight of at least one element selected from the group consisting of Ta, Zr and a mixture of Nb with Ta or/and Zr, and the remainder consisting substantially of Fe.

4,171,219

USE OF SILICON CARBIDE AS AN ADDITION TO CUPOLA FURNACES

Werner Kessl, 8481 Barnwinkel Nr. 10a, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 916,744

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727896

Int. Cl.[2] **C22C** *33/08*

U.S. Cl. 75—130 R **2 Claims**

1. In a method for the production of cast iron wherein a charge composed of more than about 40 percent by weight scrap iron is treated in an unlined cupola furnace and molded pieces of a composition containing silicon carbide are added to the charge to siliconize the charge, the improvement which comprises said molded pieces having the following composition:

25 to 60% by weight SiC,

20 to 50% by weight Al_2O_3, SiO_2 and CaO (including cement as a binding agent, in amounts of 10 to 25% by weight), having the following portions, computed as oxides

2 to 30% by weight Al_2O_3,

7 to 30% by weight SiO_2,

5 to 25% by weight CaO,

3 to 35% by weight graphite,

all percent weight being based on the total weight of the molded pieces;

with the remainder being water of crystallization and the usual impurities.

4,171,220

PHOTOGRAPHIC DYE DIFFUSION TRANSFER PROCESS

Hans Vetter, Cologne; Walter Püschel, and Paul Marx, both of Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 850,963

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652316

Int. Cl.[2] **G03C** *5/54, 1/40, 1/10*

U.S. Cl. 96—29 D **2 Claims**

1. Photographic dye diffusion transfer process for the production of color images comprising the steps of

(a) imagewise exposing a photographic material having at least one light-sensitive silver halide emulsion layer and associated therewith a non-diffusible dye-providing compound

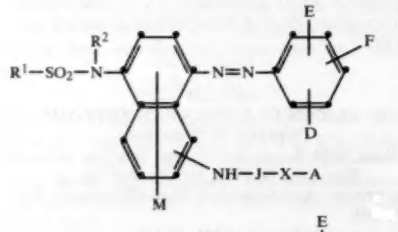
(b) developing the material to produce therein metallic silver and developer oxidation products in image distribution

(c) oxidizing said non-diffusible dye-providing compound with said developer oxidation products to provide image distributions of oxidized and non-oxidized dye-providing compound

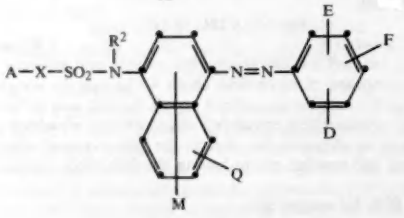
(d) releasing under alkaline development condition a diffusible dye either from said oxidized or said non-oxidized dye-providing compound, and

(e) transferring the diffusible dye to an image receiving layer to provide an image therein wherein the improvement comprises the non-diffusible dye-providing compound represented by one of the following formulae I to IV:

I

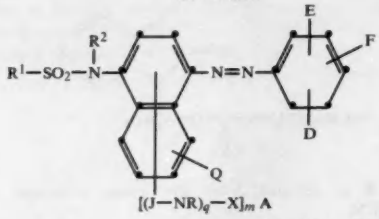


II

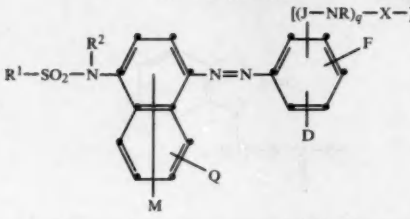


-continued

III



IV

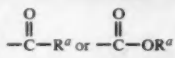


in which

A represents an oxidizable organic carrier residue containing a group which confers diffusion resistance, from which carrier residue either in the oxidized or in the unoxidized form a part thereof together with the group which confers diffusion resistance is split off under the alkaline conditions of photographic development, a diffusible azo dye being released imagewise at the same time;

R^1 represents alkyl having from 1 to 6 carbon atoms; or phenyl, which may be substituted by halogen, cyano, alkyl, alkoxy or sulphamoyl;

R^2 represents hydrogen or a hydrolysable group having the formula



in which R^a represents an alkyl having from 1 to 18 carbon atoms or a phenyl group;

X represents a bivalent connecting member having the formula $—R^b13\ (Z)_x—(R^b)y$, in which R^b represents an alkylene group having from 1 to 8 carbon atoms or a substituted or unsubstituted phenylene group and the two groups R^b may be the same or different;

Z represents —O—, —CO—, $—CONR^c—$, $—SO_2—$ or —SO— (R^c=hydrogen or alkyl);

x=0 or 1,

y=0 or 1, and y=1 when x=1;

R represents a hydrogen atom or an alkyl group having up to 6 carbon atoms;

J represents a sulfonyl or carbonyl group;

m and q each represents 0 or 1;

Q represents an alkoxy group having from 1 to 6 carbon atoms, a hydroxyl group, a group represented by one of the formulae $—NHCOR^d$ or $—NHSO_2R^d$, in which R^d represents an alkyl group having from 1 to 6 carbon atoms, a benzyl or phenyl group, which phenyl group may be substituted and has together with its substituents from 6 to 9 carbon atoms;

M represents a hydrogen atom, a halogen atom, a sulfo or sulfonic acid ester group, cyano, fluorosulfonyl, an alkylsulfinyl group having from 1 to 8 carbon atoms or a phenyl sulfinyl group, or a sulfamoyl group having the formula $SO_2NR^eR^f$ or a carbamoyl group of the formula $—CON(R^{eL})_2$, in which R^e represents hydrogen or an alkyl group having from 1 to 6 carbon atoms and R^f represents a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms, a benzyl group, a phenyl group, a substituted phenyl group having together with its substituents

from 6 to 9 carbon atoms, under the condition that the number of carbon atoms of R^e and R^f should not be higher than 14 and R^e and R^f together with the nitrogen atom to which they are attached may form a morpholine or piperidine group; an alkyl carbonyl group, a phenylcarbonyl group, an alkylsulfonyl group having from 1 to 8 carbon atoms or a substituted or unsubstituted phenyl sulphonyl group having from 6 to 9 carbon atoms;

In the case of the cyan dyes,

F represents a nitro group in the 4-position to the azo group;

D represents a halogen atom or a cyano, nitro or trifluoromethyl group or an alkyl group having from 1 to 6 carbon atoms, an alkoxy group having from 1 to 6 carbon atoms, a carboxyl group, a carboxylic acid ester group of the formula —$COOR^g$ (in which R^g represents an alkyl group having from 1 to 18 carbon atoms or a substituted or unsubstituted phenyl group having together with its substituents from 6 to 18 carbon atoms), a fluorosulfonyl or trifluoromethylsulfonyl group, a sulfo or sulfonic acid ester group, a sulfamoyl group of the formula —SO_2N-R^eR^f or a carbamoyl group of the formula —$CON(R^e)_2$ in which the groups R^e may be the same or different from each other and have the meaning already specified; an alkylsulphonyl group having from 1 to 8 carbon atoms or a phenylsulphonyl group having together with its substituents from 6 to 9 carbon atoms;

E represents a hydrogen or halogen atom or a nitro, cyano or trifluoromethyl group; and

D or $[(J—NR)_q—X—]_mA$ in formula V and E are in the ortho-position to the azo group;

In the case of magenta dyes,

F represents hydrogen, alkyl having from 1 to 4 carbon atoms or alkoxy having from 1 to 4 carbon atoms or halogen; or an electron attracting group selected from the group consisting of cyano, sulfo or a sulfonic acid ester group, fluorosulfonyl group, halogen, alkylsulfonyl group having from 1 to 8 carbon atoms, phenylsulfonyl group having together with its substituents from 6 to 9 carbon atoms, alkylsulfinyl having from 1 to 8 carbon atoms, phenylsulphinyl group having together with its substituents from 6 to 9 carbon atoms, a sulphamoyl group of the formula $SO_2NR^eR^f$ or a carbamoyl group of the formula —$CON(R^e)_2$ in which R^e and R^f have the meanings already specified; D and E which are the same or different, represent hydrogen, cyano, trifluoromethyl, fluorosulfonyl or carboxyl or a carboxylic acid ester group of the formula —$COOR^g$ in the R^g has the meaning already specified, or nitro in the 2- or 3-position to the azo group, fluorine, chlorine or bromine, alkylcarbonyl having from 2 to 7 carbon atoms, phenylcarbonyl having together with its substituents from 7 to 10 carbon atoms, alkyl sulfonyl having from 1 to 8 carbon atoms, phenylsulfonyl having together with its substituents from 6 to 9 carbon atoms, a sulphamoyl group of the formula $SO_2NR^eR^f$ or a carbamoyl group of the formula —$CO—N(R^e)_2$ in which R^e and R^f have the meaning already specified.

4,171,221
HIGH GAIN CO(III)COMPLEX IMAGING

Thap DoMinh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 627,393, Oct. 30, 1975, Pat. No. 4,045,221, which is a continuation-in-part of Ser. No. 610,954, Sep. 8, 1975, abandoned, which is a division of Ser. No. 461,172, Apr. 15, 1974, abandoned. This application May 31, 1977, Ser. No. 802,094

Int. Cl.[2] G03C *5/24, 5/00, 7/00*

U.S. Cl. 96—48 HD **5 Claims**

1. A process comprising

imagewise exposing to actinic radiation a layer sensitive to activating radiation and comprising, in intimate association, a chelating compound containing a conjugated π-bonding system capable of forming a tridentate chelate with cobalt(II) and selected from the group consisting of a 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl) formazan dye; a 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-azo-2-(phenol or naphthol); 2-pyridinecarboxylaldehyde-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-hydrazone; or 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-dithiooxamide;

less than 50 moles percent of any anions of the layer being those which will form conjugate acids by deprotonation of a cobalt(III) complex containing the chelating compound;

and an inert cobalt(III) complex different from said chelating compound and capable of being reduced by a cobalt(II) complex containing said chelating compound to produce a basic reactant; and

heating the layer above ambient temperature for a time sufficient to stimulate reduction of the cobalt(III) complex thereby obtaining

(i) concomitant release of basic reactant and

(ii) the formation of a tridentate chelate of cobalt(II) with said chelating compound,

whereby additional cobalt(III) complex is reduced by said chelate to form additional cobalt(II) and to cause additional release of basic reactant to give an amplified image.

4,171,222
TWO-COMPONENT DIAZOTYPE MATERIAL

Hans-Dieter Frommeld, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,519

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2652942

Int. Cl.[2] G03C *1/52*

U.S. Cl. 96—75 **5 Claims**

1. In a two-component diazotype material comprising a film support and a light-sensitive layer thereon, the light-sensitive layer being composed of at least one polymeric hydrophobic binder, a light-sensitive diazonium salt, and a coupler for the diazonium salt,

the improvement that the light-sensitive layer additionally contains at least one resin, containing acid groups, which resin has an acid number of at least about 100, is derived from the maleic acid or phthalic acid type, and is present in a concentration of about 5 to 30 percent by weight, relative to the hydrophobic binder used.

4,171,223
LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Heinrich Odenwälder, Cologne; Walter Püschel, and Erwin Ranz, both of Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,390

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729213

Int. Cl.[2] G03C *1/48, 5/30, 1/40, 1/06*

U.S. Cl. 96—76 R **2 Claims**

1. A color photographic material comprising in at least one silver halide emulsion layer or in a light insensitive layer of binder associated therewith, a non-diffusible thioether compound capable of reacting with the oxidation products of a primary aromatic amino color developer substance to release a diffusible silver halide development inhibitor compound, wherein the improvement comprises the non-diffusible thioether compound is a 1,2,5-Δ^2-thiadiazoline-1,1-dioxide which carries in its 4-position a thioether group of the formula —S—X wherein X represents a heterocyclic group which, when split off together with the sulfur atom of the thioether

group, forms a diffusible mercapto compound capable of inhibiting the development of the silver halide.

4,171,224

METHOD AND APPARATUS SUITABLE FOR THE PREPARATION OF AGX-EMULSIONS

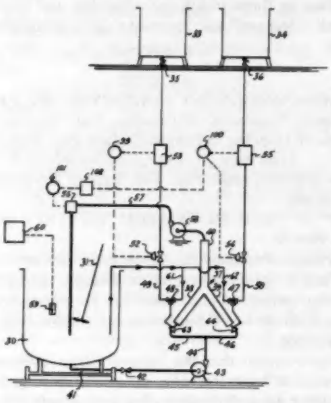
Karel E. Verhille, Hoboken; Paul V. Biermans, Borsbeek, and Roland Van Keilegom, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Sep. 12, 1977, Ser. No. 832,645

Claims priority, application United Kingdom, Sep. 14, 1976, 38022/76

Int. Cl.² G03C *1/02*

U.S. Cl. 96—94 R **11 Claims**



1. A method for the preparation of a photosensitive silver halide emulsion wherein separate streams of circulating peptizer solution are circulated with at least one power operated pump through separate mixing zones in which one is mixed with a solution of a silver salt and the other is mixed with a solution of a halide salt, and said streams are then combined and mixed in a reaction zone so that silver halide crystals are formed by reaction between silver salt and halide salt and the circulating peptizer solution contains increasing amounts of silver halide crystals in course of time, said circulation being continued until a silver halide emulsion of a predetermined concentration has been formed, characterised in that each of said separate streams of peptizer solution is formed into its corresponding separate mixing zone and thence into said reaction zone through the nozzle of a venturi-type pump and a stream of each of the silver salt solution and the halide salt solution is fed into the corresponding separate mixing zone under the influence of and at a flow rate dependent on the venturi suction effect of the corresponding venturi-type pump, said venturi pumps being operated under such conditions as to damp high frequency (above 1 Hz) pAg oscillations attributable to the inherent characteristics of each such pump used for circulating the peptizer solutions, the flow rate of each venturi pump being sufficient in relation to the operating pressure thereof that the flow is substantially independent of said pressure.

4,171,225

ELECTROLESS COPPER PLATING SOLUTIONS

Arian Molenaar; Henricus M. Van Den Bogaert, and Jan Boven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 757,879, Jan. 10, 1977, abandoned. This application Apr. 21, 1978, Ser. No. 898,652

Claims priority, application Netherlands, Jan. 23, 1976, 7600689

Int. Cl.² C23C *3/02*

U.S. Cl. 106—1.23 **4 Claims**

1. In an aqueous electroless copper plating bath comprising cupric ions, at least one compound capable of forming water-soluble complexes with cupric ions, alkali for maintaining the pH of said bath from about 12 to 13, a formaldehyde yielding compound reducing agent; the improvement consisting of an addition product of formaldehyde and an alkali metal salt of an amino acid containing at least one free $-NH_2$ group selected from the group consisting of aminoalkanecarboxylic acids and aminoalkanesulfonic acids free of bivalent sulfur, said addition product having substantially equimolar quantities of formaldehyde and amino acid salt.

4,171,226

METHOD OF DESTROYING INFECTIOUS MATERIAL OF DISPOSABLE TYPE

Sven-Gunnar Hesselgren, Angsholmen, Drottningholm, Sweden

Continuation of Ser. No. 601,632, Aug. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 333,797, Feb. 20, 1973, abandoned. This application Jun. 29, 1977, Ser. No. 811,435

Claims priority, application Sweden, Mar. 9, 1972, 2973/72

Int. Cl.² C04B *11/00*

U.S. Cl. 106—15.05 **1 Claim**

1. A method of destroying risk waste, disposable medical, including dental, instruments capable of causing injury after their initial use comprising immersing said instruments directly after use in an aqueous medium containing a microbiocidal agent, in a concentration and for a time sufficient to decontaminate said instruments, said medium being contained in a portable, disposable receptacle, thereafter adding a solidifying component consisting of gypsum to said receptacle to effect the formatiion within said receptacle of a solid mass, embedding and thereby rendering said instruments noninjurious and permanently unfit for further use, and subsequently disposing of said receptacle together with its contents.

4,171,227

ALUMINA-SILICA BINDER FOR COATING COMPOSITIONS

M. Robert Derolf, Pottstown, and Eleftherios P. Katsanis, King of Prussia, both of Pa., assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 744,490, Nov. 24, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 870,557

Int. Cl.² C09D *1/00*

U.S. Cl. 106—85 **14 Claims**

1. A stable binder composition useful in producing coatings on glass, metal and wood, comprising:

(a) 1 to 22% by weight of dispersible colloidal particles of Al_2O_3 with sufficient acid to stabilize the Al_2O_3; said acid having a monovalent cation;

(b) 0.1 to 11% by weight of finely divided precipitated silica having an ultimate particle size in the colloidal region, 1 part by weight of said silica being present for every 2 to 20 parts by weight of Al_2O_3; and

(c) the balance to 100% as water.

4,171,228
PIGMENT COMPOSITION FOR HIGH BUILD PROTECTIVE COATING

Hugh W. Lowrey, 510 Maple St., Birmingham, Ala. 35206

Continuation-in-part of Ser. No. 688,055, May 19, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 959,516

Int. Cl.[2] **C08K** *7/24*

U.S. Cl. 106—288 B **7 Claims**

1. In a pigment composition for use in a high build protective coating material in which the total pigment volume concentration thereof is not less than 40% with said coating material being adapted to be stored after pigmentation in a liquid form and to produce a minimum dry film thickness of approximately 100 microns per coat:

(a) a first group of smooth, nodular shaped pigments having a maximum specific gravity of approximately 1.3 and a maximum particle size of approximately 325 microns with not less than 40% by weight retained on a 325 mesh screen,

(b) a second group of generally nodular shaped pigments having a median particle diameter ranging from approximately 0.5 to 20 microns when sieve analysis is performed by weight, and

(c) the total volume of said first group of pigments and said second group of pigments being not less than 75% of the total volume of pigments in said coating material with a blend of said first group of pigments and said second group of pigments containing from approximately 20 to 95% by volume of said first group of pigments and from approximately 5 to 80% by volume of said second group of pigments.

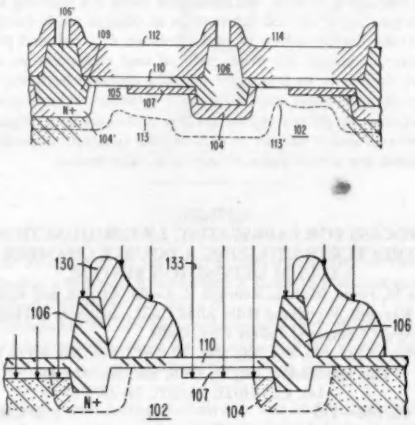
4,171,229
IMPROVED PROCESS TO FORM BUCKET BRIGADE DEVICE

Victor M. Simi, Lexington, Ky., and Donald A. Soderman, Vienna, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 809,876, Jun. 24, 1977, Pat. No. 4,142,199. This application Apr. 24, 1978, Ser. No. 899,614

Int. Cl.[2] **H01L** *11/14, 29/78, 29/34, 21/265*

U.S. Cl. 148—1.5 **5 Claims**



1. The process for making a FET bucket brigade device having an increased gate-to-drain capacitance, a reduced gate-to-source capacitance, a reduced drain-to-substrate capacitance, a reduced area and a reduced sensitivity of its threshold voltage to the source-to-drain voltage, comprising the steps of:

growing a first layer of SiO_2 on the surface of a silicon semiconductor substrate of a first conductivity type having a relatively low dopant concentration;

forming a plurality of windows spaced from one another in said first SiO_2 layer;

diffusing a plurality of regions of a second conductivity type of a relatively high dopant concentration, through said windows, one region for each window;

growing a second layer of SiO_2 in said windows, which penetrates into said region of second conductivity type forming tapered lateral transitional regions of SiO_2;

forming a plurality of gate windows in said first SiO_2 layer, one between each adjacent pair of said diffused regions, overlapping said transitional regions;

growing a third layer of SiO_2 on said surface of said substrate in said gate windows, which has a smaller thickness in said gate windows than the thickness of said transitional regions of SiO_2, due to said difference in dopant concentrations;

forming an ion-implantation mask to cover a first side of each diffusion and a channel portion of each adjacent gate window, exposing a capacitor electrode/drain extension region in each gate window adjacent to a second side of each diffusion;

ion-implanting through said third layer of SiO_2 exposed through said capacitor electrode/drain extension region of said mask forming a selectively shallow capacitor electrode/drain extension of said second conductivity type in said substrate continuous with said second side of said diffusion;

removing said mask and forming a gate electrode in said window;

whereby an improved bucket brigade device is formed.

4,171,230
TRANSFER MEDIUM WHICH IS SUITABLE FOR HEAT TRANSFER PRINTING ON ALUMINUM

Max Bolliger, Kreuzlingen, and Harald Severus-Laubenfeld, Schaffhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 24, 1978, Ser. No. 936,222

Claims priority, application Switzerland, Sep. 9, 1977, 11039/77

Int. Cl.[2] **C25D** *11/18;* **C23F** *5/04*

U.S. Cl. 148—6.1 **9 Claims**

1. A transfer medium imprinted with sublimable dispersion colorants by means of halftone printing methods, and suitable for sublimation heat transfer printing on non-sealed anodized aluminum, wherein the colors are deposited on the transfer medium by printing via the trichromatic principle using the three basic colors yellow, magenta and cyan and the transfer half lives of the three basic colors at 200° C. are between 3 and 10 seconds, and the specific weight of each of the three basic colorants differs from that of the average of the combined colorants by not more than 10%, wherein said range of transfer half lives of said basic colors ensures that the ratio of said colors remains essentially constant throughout the printing process and wherein said specific weight requirement of said basic colors ensures optimum performance of the colorant on printing the transfer medium and ease of transfer of colorants.

9. A process for printing on non-sealed anodized aluminum or aluminum alloys by means of sublimation head transfer printing, wherein the color is transferred from a transfer medium into the pores of said aluminum or aluminum alloys, wherein the colors are produced by the trichromatic principle using the basic colors yellow, magenta and cyan, and the sublimation half life of the individual colorants at 200° C. lies between 3 and 10 seconds, and the specific weight of each of the three basic colors deviates at most from that of their combined average value by a maximum of 10%, and the sublimation transfer is carried out at a temperature of 160° to 210° C. in a transfer time of 20 to 120 seconds.

4,171,231

COATING SOLUTIONS OF TRIVALENT CHROMIUM FOR COATING ZINC SURFACES

Craig V. Bishop, Cleveland; Thomas J. Foley, Shaker Heights, and James M. Frank, Olmsted Falls, all of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed Apr. 27, 1978, Ser. No. 899,543

Int. Cl.[2] C23F *7/26*

U.S. Cl. 148—6.21 **18 Claims**

1. An aqueous acidic coating solution for treating a zinc or zinc alloy surface consisting essentially of trivalent chromium as substantially the only chromium ion present, fluoride ion, an acid other than nitric acid, and an inorganic halate or peroxide.

4,171,232

ALUMINOTHERMIC REACTION MIXTURE BASED ON CUPRIC OXIDE

Theodor Finster, Hattingen; Hans-Dieter Fricke, Essen-Stadtwald, and Horst Shümann, Mulheim, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Filed Aug. 12, 1974, Ser. No. 496,863

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1973, 2363520

Int. Cl.[2] C21B *15/02*

U.S. Cl. 148—24 **3 Claims**

1. An aluminothermic reaction mixture, for preparing a metallic melt composed primarily of copper, having the following composition

70 to 75 parts by weight of cupric oxide with an oxygen content of >14 to 15% by weight,

25 to 30 parts by weight of aluminum copper alloy in a weight ratio of about 1:1 with a particle size of >0.15 mm and <1.0 mm, and

0.1 to 0.5 part by weight of finely divided carbon with a particle size of <0.2 mm.

4,171,233

LENS QUALITY OF DIE STEEL

George F. Vander Voort, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 22, 1978, Ser. No. 908,419

Int. Cl.[2] C04B *35/70*

U.S. Cl. 148—36 **7 Claims**

1. In a heat treated ferrous alloy, adapted for use as a die steel, where the heat treatment includes austenitizing, cooling and tempering, said alloy characterized in the heat treated condition by a hardness of at least 55 R_c and a charpy V-notch toughness of at least 6 ft-lbs., a high level of hardenability, and the capability of achieving a high polished surface flatness, said alloy consisting essentially of, by weight, carbon between 0.4 to 0.7%, manganese between 1.1 to 2.2%, nickel between 1.0 to 1.7%, a maximum of 0.025% phosphorus, a maximum of 0.025% sulfur, a maximum of 2.0% silicon, a maximum of 0.1% niobium, a maximum of 0.5% titanium, a maximum of 4.0% cobalt, a maximum of 0.10% aluminum, balance iron, the improvement comprising in combination therewith the provision of improving the hardenability of said alloy by adding thereto at least one element selected from the group consisting of a maximum of 3.0% chromium, a maximum of 1.5% molybdenum, a maximum of 1.5% tungsten, a maximum of 1.0% vanadium, and boron between 0.0005 and 0.12%, provided that the addition of at least one said element to improve hardenability does not result in an increase in the austenitizing temperature above about 1700° F., and that the chemistry of said alloy is further adjusted to satisfy the equation:

Surface Roughness (μ-inch) = Boron factor [7.07–12.5 (% C) + 0.72 (% Mn) + 0.45 (% Si) − 2.9 (% Ni) + 1.13 (% Ni)^2 + 0.87 (% Cr) + 2.1 (% V) + 1.12 (% Mo) + 0.84 (% W) + 14 (% Nb)], where the calculated Surface Roughness is no greater than 2.65 μ-inch, and that the Boron factor is 1.0 when boron is not present in the above given range, and 1.74 when boron is present.

4,171,234

METHOD OF FABRICATING THREE-DIMENSIONAL EPITAXIAL LAYERS UTILIZING MOLECULAR BEAMS OF VARIED ANGLES

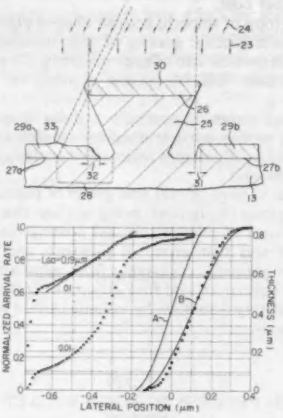
Seiichi Nagata, Sakai; Tsuneo Tanaka, and Masakazu Fukai, both of Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 13, 1977, Ser. No. 815,303

Claims priority, application Japan, Jul. 20, 1976, 51-86736; Sep. 30, 1976, 51-118126

Int. Cl.[2] H01L *21/203, 29/06*

U.S. Cl. 148—175 **26 Claims**



1. A method for manufacturing single crystal devices by molecular beams by epitaxially growing of new crystal layers over a crystal substrate which comprises:

(a) forming on one major surface of said substrate a three dimensional structure having a suitable geometrical configuration;

(b) maintaining the substrate at a predetermined temperature; and

(c) impinging at least one molecular beam for forming said crystal layer on said substrate at an oblique angle relative to the major surface of said substrate, at a reduced pressure at which the mean path of said molecules in said molecular beam is greater than the distance between the molecular beam source and said substrate, whereby said epitaxially grown crystal layer is grown on local regions of said major surface of said crystal substrate dependent upon the arrival rates of said molecular beams.

4,171,235

PROCESS FOR FABRICATING HETEROJUNCTION STRUCTURES UTILIZING A DOUBLE CHAMBER VACUUM DEPOSITION SYSTEM

Lewis M. Fraas, Malibu; Kenneth R. Zanio, Agoura, and Ronald C. Knechtli, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 864,300, Dec. 27, 1977, Pat. No. 4,128,733. This application Aug. 7, 1978, Ser. No. 931,347

Int. Cl.[2] H01L *21/205, 21/18*

U.S. Cl. 148—175 **10 Claims**

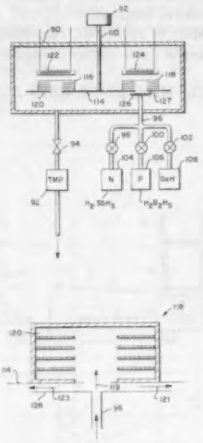
1. A process for pyrolytically depositing epitaxial layers on chosen substrates, including:

(a) providing a vacuum chamber and establishing a predetermined vacuum condition therein,

(b) providing an internal pyrolysis chamber within said vacuum chamber,

(c) mounting selected substrates in chosen locations within said pyrolysis chambers and establishing a desired controlled residual gas pressure therein,

(d) heating said substrates above a minimum and predetermined threshold epitaxial deposition temperature, and



(e) thermally decomposing a semiconductor-containing gas in said pyrolysis chamber to epitaxially deposit high purity semiconductor layers thereon.

4,171,236

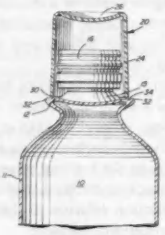
METHOD OF MAKING FRANGIBLE SEAL

David A. Winchell, Twin Lakes, Wis., and Thomas A. Fowles, McHenry, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 777,753, Mar. 14, 1977, Pat. No. 4,127,208. This application Mar. 13, 1978, Ser. No. 886,081

Int. Cl.[2] B29C *27/02;* **B65D** *41/32*

U.S. Cl. 156—69 **8 Claims**



1. A method of forming a fracturable seal of the type wherein a first part is hermetically fused to a second part, the method comprising the steps of:

assembling the first part on the second part with the first part substantially seated on the surface of the second part;

heating a sealing die above the melting point of the material of said parts;

bringing said sealing die towards said surface on which said first part is seated and alongside and in heat exchange relationship with a side portion of the first part; and

pressing said sealing die into said surface so that said surface is depressed from its original height by the sealing action of the die, with both said surface and said first part portion becoming molten and displacing said surface material to form a fused seal transverse to said surface, whereby said seal will be fractured due to tension stress when the first part is removed from the second part.

4,171,237

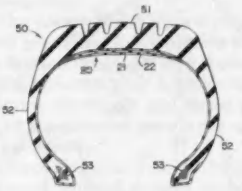
SEALANT LAMINATES

Georg G. A. Böhm, Akron, and John N. Anderson, Tallmadge, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 737,884, Nov. 2, 1976, Pat. No. 4,140,167, which is a continuation-in-part of Ser. No. 716,493, Aug. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,266, Sep. 22, 1975, Pat. No. 4,089,360. This application Apr. 20, 1978, Ser. No. 897,978

Int. Cl.[2] B29H *13/00, 17/00*

U.S. Cl. 156—115 **4 Claims**



1. In the method of manufacturing a pneumatic tire having a laminated innerliner comprising at least two layers in which one of said layers has sealant properties, the steps comprising providing a first layer of said laminate with a polymeric material that cross-links when exposed to vulcanization temperatures, providing a sealant layer of said laminate with a peroxide compound and a polymeric material that at least partially degrades when exposed to a heat treatment in the presence of a peroxide compound yielding puncture sealant properties, assembling said layers into a laminate wherein said first layer is the outer layer and said sealant layer is an inner layer, subjecting said laminate to a heat treatment so that said polymeric material in said sealant layer is at least partially degraded, assembling said laminate into said tire and vulcanizing said tire.

4,171,238

METHOD OF MAKING REINFORCED PLASTIC COMPOSITE STRUCTURE

Thomas H. Sadler, Morrison, and John J. Dalton, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Dec. 23, 1976, Ser. No. 753,973

Int. Cl.[2] B32B *5/16*

U.S. Cl. 156—173 **6 Claims**

1. In a method of making a reinforced plastic composite structure by (a) wrapping at least one layer of fibers saturated with an uncured polymeric resin matrix around a mandrel, (b) curing said polymeric matrix, and (c) subsequently removing said mandrel, the improvement comprising:

dispersing a particulate substance selected from the group consisting of portland cement, marble dust or mixtures thereof throughout said polymeric resin matrix while in a flowable uncured state, at least about 80% of said particulate susbstance having an equivalent spherical diameter in the range of about 10 to 70 microns.

4,171,239

METHOD AND APPARATUS FOR APPLYING ADHESIVE ATTACHING TAPES TO PADS

John L. Hirsch, and Edmund A. Radzins, both of Sheboygan Falls, Wis., assignors to Curt G. Joa, Inc., Sheboygan Falls, Wis.

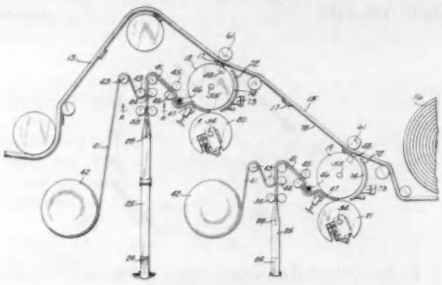
Filed Sep. 24, 1973, Ser. No. 400,091

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—461 **11 Claims**

1. Apparatus for applying adhesive attaching tapes to workpiece pads and comprising means for advancing to a tape folder an elongated strip of adhesive tape having an adhesive

face and a non-adhesive back, tape folder means for folding the elongated tape strip along a longitudinally extending hinge line to form substantially flat tape wings having their non-adhesive backs together and their adhesive faces facing away from each other, means for applying a liner to the adhesive face of one of the wings while leaving the adhesive face of the other wing exposed, a movable vacuum pad, means to apply the lined wing of said elongated folded tape strip to the vacuum pad so that the lined wing is against the pad and the adhesive face of



the other wing of the folded strip faces away from the pad, a severing tool to sever discrete folded tape segments from the folded elongated strip while the strip is held by vacuum on the vacuum pad, means for moving said vacuum pad beyond the point of severance and for applying the exposed adhesive face of said other wing to a portion of a workpiece pad, with said lined wing exposed and free for removal of the liner strip therefrom and free for unfolding said one wing about said hinge line for subsequent application to another portion of the workpiece pad.

4,171,240

METHOD OF REMOVING A CURED EPOXY FROM A METAL SURFACE

Ching-Ping Wong, West Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,367
Int. Cl.[2] B29C *17/08*
U.S. Cl. 156—630 **10 Claims**

5. A method of fabricating a mask for selectively transmitting therethrough a desired light radiant energy, which comprises:

(a) heat treating a base comprising a copolymer of tetrafluoroethylene and hexafluoropropylene for a period of time sufficient to render it essentially dimensionally stable, said base being capable of transmitting therethrough the desired radiant energy;

(b) bonding a blocking metal layer to said heat treated base by means of a fully cured epoxy adhesive said metal being resistant to dissolution by sulfuric acid;

(c) removing a portion of said blocking metal layer to delineate an exposed pattern comprising said cured epoxy;

(d) swelling said exposed cured epoxy pattern with a suitable swellant;

(e) oxidizing said swelled epoxy pattern with an oxidizing agent which gives an oxidation product which is etchable in sulfuric acid; and subsequently

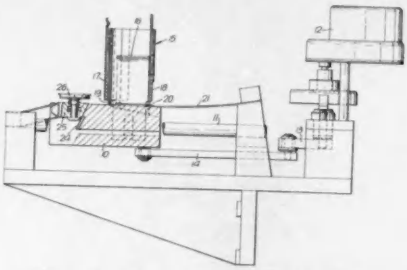
(f) exposing said oxidized epoxy pattern to an etchant comprising sulfuric acid at a temperature of from about 50° C. to 145° C. and for such a time as to remove said oxidized epoxy from said heat treated base without substantially removing exposed metal to form the mask.

4,171,241

DISPENSERS FOR THIN FLAT RIGID ARTICLES

Kenneth J. Henderson, Crowthorne, and Alan J. Gordon, Liverpool, both of England, assignors to Shandon Southern Products Limited, Cheshire, England

Filed Mar. 6, 1978, Ser. No. 883,466
Claims priority, application United Kingdom, Mar. 4, 1977, 9342/77
Int. Cl.[2] B29C *27/08*; B31B *1/64*
U.S. Cl. 156—556 **8 Claims**



1. A machine for applying microscope slide cover slips successively to a succession of microscope slides, which comprises a dispenser for sequentially dispensing the cover slips, said dispenser including

(a) a magazine for receiving a stack of the cover slips with their planes substantially horizontal;

(b) a dispensing block fixed with respect to the magazine and positioned to support the stack of said cover slips in said magazine by engaging part of the lower face of the lowermost cover slip of said stack;

(c) said dispensing block including a channel disposed to extend beneath the lower face of said lowermost cover slip and decreasing in depth in a dispensing direction;

(d) a flexible dispensing blade extending generally in said dispensing direction and having one end resting in the deeper end of said channel;

(e) the dispensing block and dispensing blade being adapted for relative reciprocating movement parallel with said dispensing direction, whereby relative movement of the blade and block towards each other causes the leading end of the blade to engage the trailing edge of said lowermost cover slip of said stack and effects displacement thereof in the dispensing direction relative to the remainder of said stack and onto a receiving surface;

(f) the thickness of the blade and the configuration of the channel being so related that, in the relative positions of the blade and block in which the leading end of the blade first contacts the trailing edge of the lowermost cover slip, the blade leading end projects above the block surface supporting the cover slip by a distance less than the nominal thickness of the cover slip;

(g) resilient barrier means for restraining movement, in the said dispensing direction, of cover slips in said stack other than said lowermost cover slip;

(h) a mountant applicator for applying mountant to each dispensed cover slip;

(i) means for feeding microscope slides successively to a mounting station in coordination with the motion of said dispensing block; and

(j) means for bringing a mountant-bearing cover slip into engagement with a microscope slide at the mounting station to fix the cover slip to the slide.

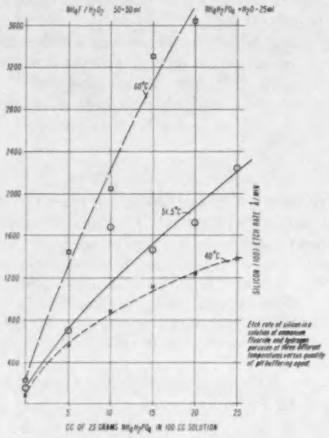
4,171,242
NEUTRAL PH SILICON ETCHANT FOR ETCHING SILICON IN THE PRESENCE OF PHOSPHOSILICATE GLASS

Cheng-Yih Liu, Woodbridge, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 751,619, Dec. 17, 1976, abandoned. This application Mar. 8, 1978, Ser. No. 884,678

Int. Cl.[2] H01L *21/306*

U.S. Cl. 156—657 **14 Claims**



1. A method for preferentially etching a silicon workpiece in the presence of a phosphosilicate glass structure, comprising the steps of:

applying to the surface of said silicon workpiece in the presence of said phosphosilicate glass structure, an aqueous solution of fluoride ions and oxygen atoms produced by an oxygen atom donor, maintained at a pH of between 6 and 8.2.

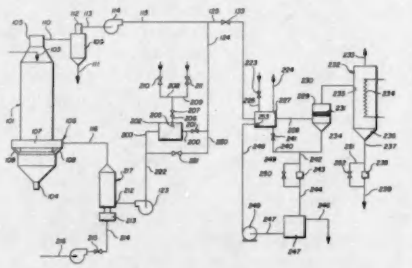
4,171,243
SPRAY DRYING METHOD

Burton Brooks, Bellevue, and Richard J. Brooks, Seattle, both of Wash., assignors to The Chemithon Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 587,700, Jun. 17, 1975, which is a division of Ser. No. 393,192, Aug. 30, 1973, abandoned. This application Dec. 12, 1977, Ser. No. 859,943

Int. Cl.[2] B01D *1/16*

U.S. Cl. 159—48 R **24 Claims**



1. In a method including spray drying material in a spray drying tower and then removing solid particulates and fumes from the hot effluent gases leaving said tower, wherein said tower receives a solids-containing, aqueous, liquid slurry and a heated gas stream for drying the solids contained in said slurry, the steps comprising:

discharging from said spray drying tower hot effluent gases containing steam and having a temperature above the dew point of said discharged gases;

dividing said discharged hot gases into a first portion and a second portion;

heating said first portion of the discharged hot gases to a temperature above the temperature of the solids-containing, aqueous, liquid slurry, and further above the dew point of said discharged gases, without cooling said first portion below its dew point between said dividing step and said heating step;

recycling said first portion to said spray drying tower as part of said heated gas stream, following said heating step, to increase the moisture content of said discharged gases;

contacting said solids-containing, aqueous, liquid slurry in said spray drying tower with said heated gas stream including said recycled, heated gases to dry said slurry with said heated gas stream;

subjecting said second portion of the discharged gases, having said increased moisture content resulting from said recycling step, to a condensing step by cooling said gases to agglomerate said solid particulates and fumes therein;

and then removing said agglomerated solid particulates and fumes from said cooled gases, without heating said second portion between said condensing and removing steps;

the moisture content of the discharged hot gases undergoing said condensing step being higher than the moisture content thereof absent said recycling step.

4,171,244
ENZYME-BOUND-POLYIDOTHYRONINE

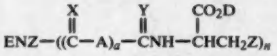
Judith I. Blakemore, Mill Valley; Richard K. Leute, Sunnyvale, and Roberta D. Ernst, Mountain View, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 644,408, Dec. 29, 1975, Pat. No. 4,043,872, which is a continuation-in-part of Ser. No. 551,566, Feb. 20, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,514

Int. Cl.[2] C07G *7/02;* **G01N** *31/14*

U.S. Cl. 435—188 **13 Claims**

1. An ENZ-bound-ligand of the formula



wherein:

ENZ is an enzyme reversibly inhibited by ligand selected from the group consisting of malate dehydrogenase and triose phosphate isomerase;

a is 0 or 1;

n is on the average at least one and not more than about 10;

X and Y are the same or different and are chalcogen or amino;

D is hydrogen or an alkyl group of from 1 to 6 carbon atoms;

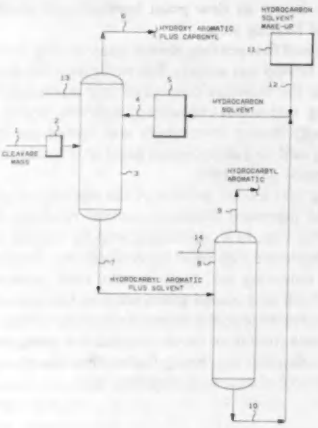
Z is 3,5-diiodo-4-(3',5'-diodo-4'-hydroxyphenoxy-1')phenyl-1; and

A is a bond or an organic divalent group of from 1 to 12 carbon atoms and 0 to 6 heteroatoms which are oxygen, sulfur or nitrogen, the total number of heterofunctionalities being in the range of 0 to 4.

4,171,245
EXTRACTIVE DISTILLATION WITH HYDROCARBON SOLVENT OF MIXTURE OF HYDROCARBYL AROMATIC COMPOUND, HYDROXY AROMATIC COMPOUND AND CARBONYL COMPOUND

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 1, 1977, Ser. No. 802,228
Int. Cl.[2] B01D *3/40*
U.S. Cl. 203—68 8 Claims

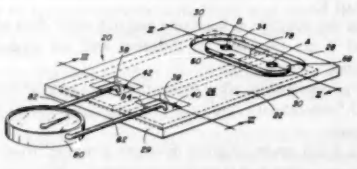


1. A method for the continuous extractive distillation of a reaction mass obtained upon acid-catalyzed cleavage of the oxidation product of a hydrocarbyl aromatic compound, said mass containing said hydrocarbyl aromatic compound, which comprises conducting extractive distillation employing a hydrocarbon solvent having a boiling point higher than that of the hydrocarbyl aromatic compound and being a liquid under the conditions of the operation, by feeding said reaction mass into a distillation column at an intermediate point thereof, continuously introducing hydrocarbon solvent into said column at a point above the introduction of said reaction mass, but below the top of said column, taking off as overhead hydroxy aromatic compound and carbonyl compound, and continuously withdrawing hydrocarbyl aromatic compound and solvent as bottoms from said column.

4,171,246
METHOD FOR DETERMINING IONIC ACTIVITY OF COMPONENTS OF LIQUID DROPS

David P. Hamblen, Rochester; Clyde P. Glover, Pittsford, and Sang H. Kim, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 687,725, May 19, 1976, Pat. No. 4,053,381.
This application Jul. 14, 1977, Ser. No. 815,881
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T 5 Claims



1. A method for potentiometrically determining the activity of an ionic analyte in an aqueous solution, the method comprising the steps of

(a) providing a device comprising two solid electrodes mounted on a frame, said electrodes each comprising a first operative layer coated over at least one other operative layer, said layers terminating at edges, and means for providing ionic flow between said electodes, said device including at each electrode, anti-shorting means for restraining a solution deposited on said first layer from simultaneously contacting the edges of both of said layers;

(b) contacting a drop of an unknown solution with one of said electrodes and said flow-providing means;

(c) contacting a drop of a reference solution containing a known amount of the analyte, with the other of said electrodes and said flow-providing means; and

(d) detecting and comparing the electrical potentials generated by the analyte in contact with the electrodes.

4,171,247
METHOD FOR PREPARING ACTIVE CATHODES FOR ELECTROCHEMICAL PROCESSES

Hakon Harang, Gjettum; Karl Widding, Oslo; Knut A. Andreassen, Porsgrunn, and Johan B. Holte, Blommenholm, all of Norway, assignors to Norsk Hydro a.s., Norway

Filed Feb. 24, 1978, Ser. No. 881,052
Claims priority, application Norway, Feb. 24, 1977, 770616
Int. Cl.[2] C25D *5/36, 5/40*
U.S. Cl. 204—34 5 Claims

1. In a method for the preparation of active cathodes suitable for electrolysis for water wherein the cathode substrate is cleaned and etched in nitric acid and is then activated by galvanic coating in a bath containing a nickel salt and a sulphur liberating component, the improvement wherein:

(a) the etching of the cathode is performed within 5–10 minutes in a nitric acid solution with a concentration of 10–25%;

(b) the temperature is kept at 35°–45° C. during the etching;

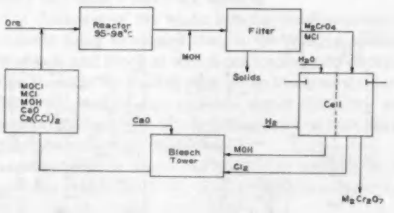
(c) the cathode is activated in a bath with 50–350 g/l nickel sulphate-hydrate, 10–200 g/l thiourea; and

(d) the temperature is kept at 30°–60° C. and the pH is kept at 3–6, while the activation is performed during application of a cathodic current density of 0.3–6 A/dm^2.

4,171,248
METHOD OF OPENING CHROME ORE

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 3, 1977, Ser. No. 848,043
Int. Cl.[2] C25B *1/14*
U.S. Cl. 204—89 12 Claims



1. A method of opening $FeO.Cr_2O_3$ ore comprising the steps of:

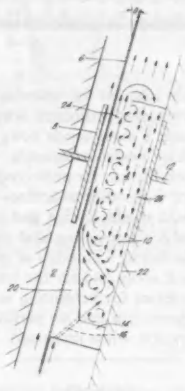
contacting the ore with an aqueous alkali metal hypochlorite solution below the boiling point of said solution whereby to form an aqueous acidic slurry; and

recovering a liquid containing hexavalent chromium from said aqueous slurry.

4,171,249
CIRCULATING BED ELECTRODES IMPROVEMENTS IN OR RELATING TO

Alan F. R. Newton, Portsmouth; Kendrick P. Haines, Havant; David Harrison, and John F. Davidson, both of Cambridge, all of England, assignors to Parel Societe Anonyme, Luxembourg

Filed Mar. 17, 1978, Ser. No. 887,769
Claims priority, application United Kingdom, Mar. 17, 1977, 11493/77
Int. Cl.[2] C25C *1/00, 7/00, 7/02*
U.S. Cl. 204—105 R **41 Claims**



1. An electrochemical process for electrowinning, electrorecovering, or electrorefining a metal by applying an electrolysis current in which there is used a particulate electrode located in an electrochemical cell or a compartment of an electrochemical cell, and in which a fluid is supplied to the particulate electrode so as to cause the majority of the particles which constitute the particulate electrode to undergo systematic circulatory movement within the cell or the compartment of a cell, wherein the motion of the particles is controlled at least in part by the provision of stabilising means on a wall defining part of the area occupied by the particulate electrode, the stabilising means being shaped and positioned so as to provide generally unidirectional flow channels which encourage vertical flow and discourage bulk lateral movement of the particles in the region of the said wall.

4,171,250
METHOD FOR ZINC ORE EXTRACTION

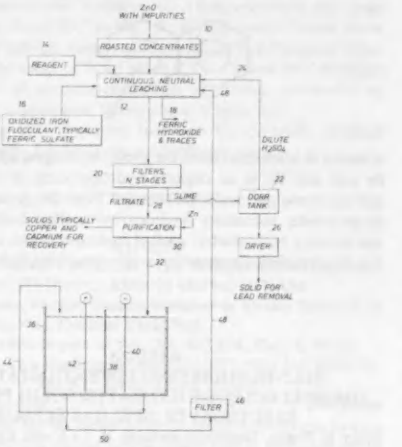
William L. Eddleman, Houston, Tex., assignor to David B. Dean, Houston and Douglas B. Hayden, Jr., Beaumont, both of, Tex., part interest to each

Continuation of Ser. No. 737,728, Nov. 1, 1976, abandoned, which is a continuation of Ser. No. 626,912, Oct. 29, 1975, abandoned. This application May 25, 1978, Ser. No. 909,432
Int. Cl.[2] C25C *1/16, 7/04*
U.S. Cl. 204—119 **7 Claims**

1. A method of extracting zinc from calcined zinc ore comprising the steps of:

leaching the zinc ore with an acid solution to form a zinc sulfate solution; and

introducing the zinc sulfate solution into the cathode compartment of a container divided into anode and cathode compartments containing, respectively, an anode and a cathode by a microporous polymer diaphragm characterized by having a reduced bulk density as compared to the bulk density of the corresponding polymer film having no open-celled structure, a crystallinity of about about 30%, a pore size of less than 5,000 angstroms, and a nitrogen flux, measured after one hour storage at 65° C., of more than 30, permeable to cations and anions, inherently hydrophobic, and specially processed to provide a pore structure which provides a barrier to water molecules and water of hydration and passing a direct current between



the anode and cathode to deposit elemental zinc on the cathode.

4,171,251
LASER PHOTOCHEMICAL SEPARATION OF HYDROGEN ISOTOPES

Michael C. Fowler, Farmington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 1, 1977, Ser. No. 856,720
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R **17 Claims**

1. A method for obtaining isotopes of hydrogen by photodissociation of organic acid comprising:

providing an organic acid having molecules of hydrogenated and deuterated organic acid;

providing radiation having a wavelength in the infrared spectrum matched to an absorption line of a chemical bond of the molecule of deuterated organic acid;

maintaining the organic acid at an elevated temperature to thermally decompose dimer molecules of hydrogenated organic acid having an absorption line matched to the wavelength of the radiation to monomer molecules having an absorption line not matched to the wavelength of the radiation;

interacting the radiation with the organic acid to excite vibrational energy levels of the chemical bonds of the molecules of deuterated organic acid; and

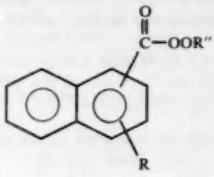
maintaining the interaction to provide sufficient energy to the chemical bonds of the molecules of deuterated organic acid to photodissociate the molecules to form a deuterium enriched reaction product plus a dissociation product.

4,171,252
PEROXY PHOTOINITIATOR SYSTEM FOR PHOTOPOLYMERIZABLE COMPOSITIONS

Richard M. Fantazier, Mountville, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 699,711, Jun. 25, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 894,133
Int. Cl.[2] C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **1 Claim**

1. A method for producing a photopolymer which method comprises incorporating into an ethylenically unsaturated photopolymerizable mass from about 0.1 to about 20 percent by weight of the photopolymerizable mass of a photoinitiating compound of the formula



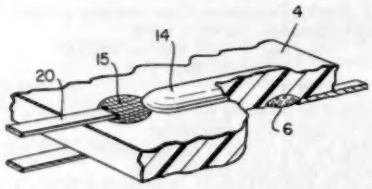
wherein R is selected from the group hydrogen, alkyloyl, alkyl or aryl and R″ is an organic hydroperoxide of less than 15 carbon atoms per molecule selected from the group t-alkylhydroperoxide, secondary hydrocarbyl aralkyl hydroperoxide, and tertiary hydrocarbyl aralkyl hydroperoxide, and irradiating the resulting composition with ultraviolet light.

4,171,253

SELF-HUMIDIFYING POTENTIOSTATED, THREE-ELECTRODE HYDRATED SOLID POLYMER ELECTROLYTE (SPE) GAS SENSOR

Mary E. Nolan, Topsfield; Anthony B. La Conti, Lynnfield, and Russell M. Dempsey, Hamilton, all of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed Feb. 28, 1977, Ser. No. 773,136
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **8 Claims**



1. In an electrochemical gas-sensing device for detecting the concentration of a selected gaseous constituent in a carrier gas stream, the combination comprising:

(a) an ion transporting membrane;

(b) catalytic sensing and reference electrodes positioned on one side of the membrane and a counter electrode positioned on the opposite side of said membrane;

(c) potentiostatic circuiting coupling the sensing, reference and counter electrodes for maintaining the potential at the sensing electrode constant and for maintaining a fixed potential difference between sensing and reference electrodes by driving current between the counter and sensing electrodes through said ion transporting membrane, said sensing electrode being maintained at a potential which makes the device insensitive to the carrier gas;

(d) an ionically conductive, low-resistance path on one side of the membrane, said path extending between the counter electrode and an area which is spatially aligned with the reference electrode, said membrane having been treated to provide said low-resistance path between the counter electrode and an area spatially aligned with said reference electrode;

(e) means for exposing the sensing electrodes to a carrier gas stream containing the gaseous constituent to be sensed;

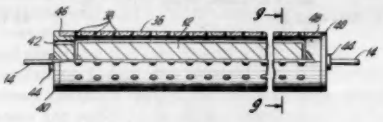
(f) means for measuring the current which flows between the counter and sensing electrodes to maintain the sensing potential constant, said current being a measure of the gas concentration.

4,171,254

SHIELDED ANODES

Donald F. Koenecke, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 755,572, Dec. 30, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,526
Int. Cl.[2] C23F *13/00*; **C25B** *11/00*
U.S. Cl. 204—197 **14 Claims**



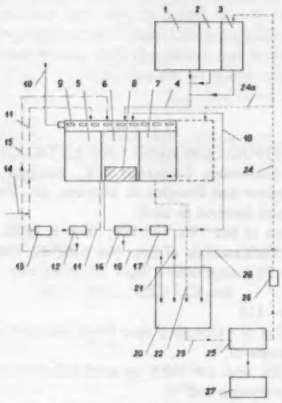
1. A shielded anode adapted for withstanding impacts and providing cathodic corrosion protection when immersed in an electrolyte, comprising: a main anode body and substantially rigid protective shield means completely surrounding said body in spaced relation thereto for protecting said anode body against direct contact with other structures and withstanding substantial impact, said shield having end covers secured at opposite ends thereof for supporting said anode body in said spaced relation and including a plurality of spaced perforations extending through and about and for the length of said shield at predetermined locations for permitting said anode to be in contact with said electrolyte and to perform its normal cathodic protective function when immersed.

4,171,255

APPARATUS FOR RECOVERY OF METALS FROM METAL PLATING BATHS AND NEUTRALIZING TOXIC EFFLUENTS THEREFROM

Franciszek Tuznik, and Andrzej Lis, both of Warsaw, Poland, assignors to Instytut Mechaniki Precyzyjnes, Warsaw, Poland

Division of Ser. No. 770,026, Feb. 18, 1977. This application Nov. 15, 1977, Ser. No. 851,789
Int. Cl.[2] C25D *21/04, 21/06, 21/16*
U.S. Cl. 204—238 **6 Claims**



1. Apparatus for recovery of metals and neutralization of toxic effluents from plating bath effluents comprising:

A. a preparatory dosing means comprising three tanks: a first tank for reagents; a second tank for flocculating agents and coagulants; and a third tank for water, connected by means for communication for liquid flow to a

B. treatment means provided with means for removing noxious fumes from plating bath effluents comprising three tanks: a first tank for a plating bath; a second tank for

a reclaiming bath; and a third tank for water, connected by means for communication for liquid flow to a

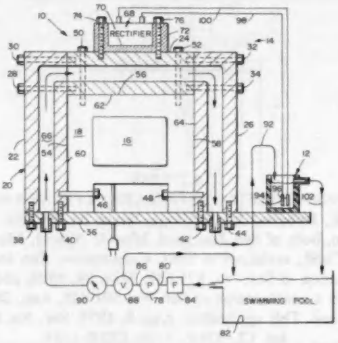
C. water regeneration means connected by means of conduits to said preparatory dosing means and said treatment means.

4,171,256

CHLORINE GENERATION APPARATUS

Tim Themy, 4984 S. 360 West, Murray, Utah 84106

Filed Nov. 3, 1978, Ser. No. 957,566
Int. Cl.[2] C25B *15/08;* C02B *1/82;* C25B *9/00*
U.S. Cl. 204—239 9 Claims



1. A compact device for generating chlorine for sterilizing use in swimming pools, health spas, water supplies, and the like, comprising, in combination:

a power transformer having a housing thereabout in heat conductive contact therewith;

a highly heat conductive metal frame attached in direct efficient heat conductive relation with said housing, said frame having a conduit therethrough generally adjacent to said housing;

a metal block having a cavity therein;

a semi-conductor power rectifier held in said cavity in thermal contact with said block;

means for attaching said block in direct heat conductive relation with said frame;

means for flowing an aqueous coolant through said conduit for cooling said frame and thereby cooling both said transformer and said rectifier;

a chlorine generating electrolytic cell having an anode and a cathode;

means for connecting an output from said rectifier to said anode and said cathode;

means for conducting said coolant into said cell where it serves as the electrolyte therein; and

means for conducting overflow coolant having enhanced chlorine level therein from said cell to an aqueous liquid containing reservoir to increase the chlorine content in said reservoir and thereby provide a sterilizing action.

4,171,257

PETROLEUM DISTILLATE UPGRADING PROCESS

Dennis J. O'Rear, Tiburon, and Jerome F. Mayer, San Anselmo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 23, 1978, Ser. No. 954,062
Int. Cl.[2] C10G *11/04, 13/04;* B01J *29/28;* C10L *1/04*
U.S. Cl. 208—120 7 Claims

1. A process for upgrading a petroleum distillate feed consisting essentially of hydrocarbons having a normal boiling point range in the range of from about 400° to 1000° F. and producing a C_3–C_4 olefin product fraction, based upon feed converted, in an amount in the range of from about 2 to 10 weight percent, comprising:

(1) producing an effluent stream containing a C_3–C_4 olefin product fraction by contacting said feed with a catalyst consisting essentially of ZSM-5 crystalline aluminosilicate which is substantially in the H-form, said contacting being under conditions including (a) a temperature in the range of from about 500° to 800° F.; (b) a pressure below about 13 atmospheres gauge, and (c) a liquid hourly space velocity in the range of from about 0.1 to 15, said feed having a content of nitrogen-containing impurities, calculated by weight as nitrogen, below about 5 ppm; and

recovering said upgraded feed and C_3–C_4 olefin product fraction by fractionating said effluent stream.

4,171,258

CATALYST AND PROCESS FOR HYDROCONVERSION OF HYDROCARBONS USING STEAM

Noel J. Gaspar, Sarnia, Canada, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 637,274, Dec. 3, 1975, abandoned. This application Aug. 26, 1977, Ser. No. 828,078
Int. Cl.[2] C10G *23/12, 35/06*
U.S. Cl. 208—144 27 Claims

1. A process for the steam hydroconversion of a light hydrocarbon feed stock boiling below about 400° F. and containing olefins and sulfur compounds to desulfurize said feedstock and hydrogenate said olefins in the absence of added hydrogen, said process comprising passing said feedstock and steam into a steam hydroconversion zone over a dual function catalyst comprising molybdenum on a base selected from the group consisting of (a) a high surface area alumina and (b) a mixture of iron oxide and chromium oxide, said catalyst being sulfided prior to use.

4,171,259

REFORMING WITH MULTIMETALLIC CATALYSTS

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 862,114, Dec. 19, 1977, which is a continuation-in-part of Ser. No. 826,996, Aug. 23, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 950,806
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 1 Claim

1. A process for reforming a hydrocarbon feed at reforming conditions with a reforming catalyst which comprises a Group VIII noble metal hydrogenation-dehydrogenation component, a component comprised of iridium or rhenium, or both, a halogen component, and sufficient of a sulfurous acid or sulfuric acid component to increase the activity or selectivity, or both, as contrasted with a catalyst otherwise similar except that it does not contain sulfurous acid or sulfuric acid.

4,171,260

PROCESS FOR REDUCING THIOPHENIC SULFUR IN HEAVY OIL

Malvina Farcasiu, and Eric J. Y. Scott, both of Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,668
Int. Cl.[2] C10G *29/22, 29/04*
U.S. Cl. 208—240 11 Claims

1. A process for desulfurizing a thiophenic sulfur-containing heavy hydrocarbonaceous oil feed which comprises reacting the oil feed with a C_1–C_4 alkanol in the presence of a non-acidic zeolite catalyst selected from alkali metal and alkaline earth metal forms of zeolites at a temperature in the range between about 450° F. and 850° F.

4,171,261

PROCESS FOR THE FLOTATION OF ORES AND COLLECTOR FOR USE IN THIS PROCESS

Wim Dorrepaal; Gerardus M. van den Haak, both of Bodegraven; Joseph M. Weehuizen, Oegstgeest, and Johan G. Aalbers, Bodegraven, all of Netherlands, assignors to Chem-Y, Fabriek van Chemische Produkten B.V., Bodegraven, Netherlands

Filed Nov. 8, 1976, Ser. No. 740,078

Claims priority, application United Kingdom, Nov. 11, 1975, 46601/75

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 4 Claims

1. In a process for the flotation of minerals chosen from the group consisting of minerals containing alkaline earth metal ions and oxidic copper minerals and oxidic iron minerals the improvement consisting of using as a collector a composition consisting essentially of (1) at least one compound of the formula $RO-(C_xH_{2x}O)_nCH_2COOM$, wherein R is a residue chosen from the group of aliphatic residues of 8–18 carbon atoms and alkylaryl residues having 6–12 carbon atoms in the alkyl moiety, n is a number having an average value of 0–10 and x is a number having one of the values 2 and 3, and M is a monovalent cation, and (2) a usual, oleic acid-containing, fatty acid type collector wherein the ratio between component (1) and component (2) is at least 1:30.

4,171,262

APPARATUS FOR ELIMINATING METALLIC CONTAMINATIONS FROM A FIBRE TRANSPORTING DUCT IN SPINNING PREPARATION

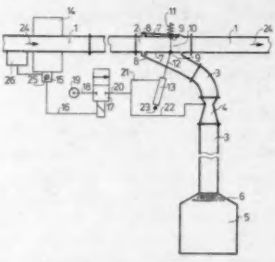
Werner Lattmann, and Rudolf Wildbolz, both of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 31, 1978, Ser. No. 911,062

Claims priority, application Switzerland, Jun. 9, 1977, 7094/77

Int. Cl.[2] B07C *5/00, 5/344*

U.S. Cl. 209—555 12 Claims



1. An apparatus for eliminating metallic contaminations from a fibre transporting duct in spinning preparation, wherein an air stream transports fibre flocks through the fibre transporting duct, comprising:

a fibre transporting duct;

a waste duct operatively connected with the fibre transporting duct at a branching point thereof;

deflecting means for the fibre flocks;

means for pivotably mounting said deflecting means at the branching point of the fibre transporting duct;

a drive mechanism for activating said deflecting means;

a metal detector arranged upstream of the branching point with respect to the direction of movement of the fibre flocks through the fibre transporting duct and surrounding at least a portion of the fibre transporting duct;

means defining a power source for operating said drive mechanism;

control means for operatively communicating said power source with said drive mechanism for selectively activating said deflecting means;

said metal detector being operatively connected with said control means for activating said deflecting means in response to the passage of a metallic object through said portion of the fibre transporting duct at least partially surrounded by said metal detector, in order to shift within a short time the deflecting means from an idle position, where the fibre transporting duct is open and the waste duct is maintained closed, into a working position, in which the fibre transporting duct is closed and the waste duct is maintained open.

4,171,263

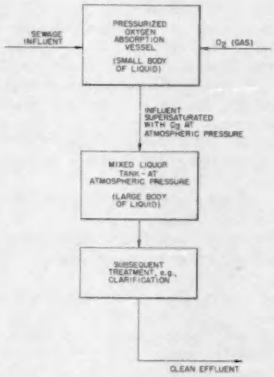
PRESSURIZED OXYGENATION OF SEWAGE

Thomas E. Roberts, Jr., Saratoga; Bruce M. Wright; Clyde D. Watson, both of San Jose, and John A. Abbott, Menlo Park, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 671,659, Mar. 29, 1976, abandoned, which is a continuation of Ser. No. 501,423, Aug. 28, 1974, abandoned. This application Aug. 8, 1977, Ser. No. 822,594

Int. Cl.[2] C02C *1/06;* C02B *1/34*

U.S. Cl. 210—8 14 Claims

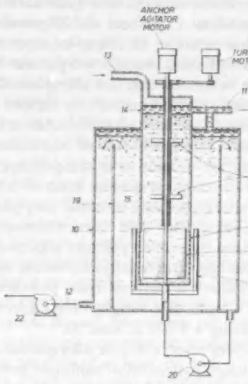

SEWAGE INFLUENT
PRESSURIZED OXYGEN ABSORPTION VESSEL (SMALL BODY OF LIQUID)
O_2 (GAS)
INFLUENT SUPERSATURATED WITH O_2 AT ATMOSPHERIC PRESSURE
MIXED LIQUOR TANK - AT ATMOSPHERIC PRESSURE (LARGE BODY OF LIQUID)
SUBSEQUENT TREATMENT, e.g., CLARIFICATION
CLEAN EFFLUENT

6. In an activated sludge sewage treatment process wherein the biodegradable matter in the sewage is oxidized by dissolved oxygen acting on the sewage within a mixed liquor tank, the improvement comprising the steps of dissolving oxygen in at least a portion of the influent to the mixed liquor tank under superatmospheric pressure conditions of at least several atmospheres, releasing the pressure on said portion of the influent to bring it to atmospheric pressure while imparting a minimum of turbulence to said influent portion and maintaining it in a substantially undisturbed condition, said depressurization step being accomplished without causing said body of liquid to flow along a path having a sharp or sudden pressure drop therein, gently directing said portion of the influent into said mixed liquor tank while imparting a minimum of turbulence thereto so that the dissolved oxygen will be maintained in said portion of the influent under supersaturated conditions, and mixing said portion of the influent with the sewage in said mixed liquor tank and thereby raising the dissolved oxygen level of the sewage in the tank to increase the rate of said sewage treatment process.

4,171,264
METHOD FOR CONTINUOUSLY SEPARATING EMULSIONS

Arnold M. Benson; James E. Heath, and Mark A. Matovich, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 587,502, Jun. 16, 1975, abandoned. This application May 27, 1977, Ser. No. 801,126
Int. Cl.[2] B01D *19/00*
U.S. Cl. 210—40 3 Claims

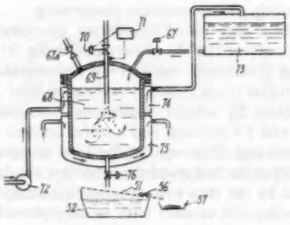


1. A process for separating the phases of a liquid-liquid emulsion of 30 to 5000 ppm of a disperse phase of oil in a continuous phase of saline water, comprising, contacting the emulsion with from about 1000 to about 5000 ppm of length-classified, chemically-pulped cellulose of fibers having a minimum length of about 50 to 100 microns, and separately withdrawing oil and water.

4,171,265
SUPPRESSION OF POLLUTION IN MINERAL FIBER MANUFACTURE

Jean A. Battigelli, Rantigny, and Marie-Pierre Barthe, Clermont, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 747,432, Dec. 3, 1976, Pat. No. 4,111,672, which is a continuation-in-part of Ser. No. 655,503, Feb. 5, 1976, abandoned, which is a continuation of Ser. No. 511,500, Oct. 2, 1974, abandoned. This application Jun. 23, 1978, Ser. No. 918,600
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—56 5 Claims

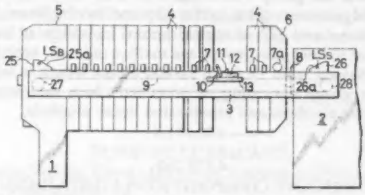


2. A continuous method for separating heat hardenable constituents from an aqueous solution of thermohardenable fiber binder material which method comprises insolubilizing said constituents by heating said constituents in a system comprising a heat exchanger, a continuous flow heater, and a continuous flow reactor, preheating the aqueous solution to be treated by passing it through said heat exchanger, heating said preheated solution in said continuous flow heater to a temperature between about 150° C. and about 240° C. and at a pressure from about 6 to about 40 bars, by the injection of steam, effecting insolubilization of said heated water by passing it through said reactor, cooling said solution by returning it to said heat exchanger, and thereafter separating the insolubilized constituents from the water.

4,171,266
RECIPROCALLY DRIVEN APPARATUS FOR TRANSPORTING FILTER PLATES IN FILTER PRESS

Tetsuya Kurita, Takarazuka, and Muneyuki Miyano, Sakai, both of Japan, assignors to Kurita Machinery Manufacturing Company Limited, Japan

Filed Dec. 9, 1977, Ser. No. 859,095
Int. Cl.[2] B01D *25/00*
U.S. Cl. 210—230 13 Claims



1. An apparatus to be driven reciprocally for transporting filter plates for use in a filter press including a pair of reciprocally movable carriers each provided with two dogs raisable and tiltable in operative relation to each other by a freely movable member, the dogs being cooperative with a handle on each of the filter plates to transport the filter plates, comprising:

a. means for biasing the two dogs to tilt the dogs toward the direction opposite to a direction of transport of the filter plates; and

b. a stopper for preventing one of the dogs positioned toward the opposite direction to the direction of transport of the filter plates from tilting toward the same direction, and a stopper for preventing the other dog positioned toward the transport direction from tilting toward the same transport direction, the first-mentioned stopper being capable of selectively preventing the tilting of said one dog positioned toward the opposite direction or releasing the same dog from its prevented position and the first-mentioned stopper provided for said one dog positioned toward the opposite direction is detachably mounted on the carrier.

10. An apparatus to be driven reciprocally for transporting filter plates for use in a filter press including a pair of reciprocally movable carriers each provided with two dogs raisable and tiltable in operative relation to each other by a freely movable member, the dogs being cooperative with a handle on each of the filter plates to transport the filter plates, comprising:

a. means for biasing the two dogs to tilt the dogs toward the direction opposite to a direction of transport of the filter plates; and

b. a stopper for preventing one of the dogs positioned toward the opposite direction to the direction of transport of the filter plates from tilting toward the same opposite direction, and a stopper for preventing the other dog positioned toward the transport direction from tilting toward the same transport direction, the first-mentioned stopper being capable of selectively preventing the tilting of said dog positioned toward the opposite direction or releasing the same dog from its prevented position and the first-mentioned stopper provided for said one dog positioned toward the opposite direction is pivoted to the

carrier so as to be movable between a horizontal position for engaging the same dog and a downwardly inclined position for releasing the same dog from the engagement.

4,171,267
ORGANOPOLYSILOXANE-HYDROCARBON OIL SOLUTIONS

Richard C. McAfee, Adrian, and Jerold A. Craig, Jasper, both of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Oct. 30, 1978, Ser. No. 955,834
Int. Cl.[2] D06M *13/10*
U.S. Cl. 252—8.6 **24 Claims**

1. A composition containing (A) a bridging agent, (B) a hydrocarbon oil and (C) an organopolysiloxane fluid, in which the organopolysiloxane (C) is immiscible with hydrocarbon oil (B) in the absence of bridging agent (A), said bridging agent is obtained from the reaction of (1) an organopolysiloxane selected from the group consisting of (i) a hydroxyl-terminated organopolysiloxane, (ii) a cyclic siloxane having from 3 to 8 silicon atoms and (iii) mixtures thereof in which at least 80 percent of the organic groups are methyl radicals, with (2) an alcohol having from 12 to 28 carbon atoms which is selected from the group consisting of branched chain saturated and unsaturated alcohols and unsaturated linear alcohols.

4,171,268
LUBRICANT COMPOSITIONS CONTAINING ZIRCONYL SOAPS

Albert V. Collins, Fairview Park, Ohio, assignor to Mooney Chemicals, Inc., Cleveland, Ohio

Filed May 22, 1978, Ser. No. 908,079
Int. Cl.[2] C10M *1/48, 1/42, 1/38, 1/26*
U.S. Cl. 252—32.7 E **22 Claims**

1. A lubricating composition comprising a major proportion of an oleaginous liquid of lubricating viscosity and a minor amount of an additive composition comprising a mixture of

(a) a zirconium salt of a carboxylic acid or mixture of carboxylic acids, and

(b) at least one oil-soluble sulfur-containing extreme pressure agent containing up to about 25% combined sulfur.

4,171,269
SULFURIZED LUBRICANT COMPOSITION

Rodney L. Sung, Fishkill, and Benjamin H. Zoleski, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,659
Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 **1 Claim**

1. A lubricating oil composition comprising:

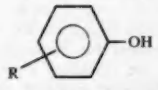
a hydrocarbon base oil of lubricating viscosity having an SUS viscosity at 100° F. of between about 50 and 250;

a sulfurized overbased calcium alkylphenolate having a calcium metal to alkylphenol ratio of at least 2.9:2; a calcium content by weight of the total composition of between 6 and 7.4 percent, and a sulfur content of between 0.5 percent and 12 percent of the total composition;

wherein said sulfurized calcium alkylphenolate is produced by the step-wise process that comprises:

(1) introducing into contact with an alkylphenol of the formula:

(I)



wherein R is from 1 to 2 monovalent alkyl radicals, each containing from 4 to 50 carbons, a calcium alkoxyalkoxide of the formula:

$$Ca—O\text{-}A\text{-}OR')_2 \quad \text{(II)}$$

wherein A is an alkanediyl radical of from 1 to 6 carbon atoms, and R′ is an alkyl radical of from 1 to 25 carbon atoms, at a temperture between 200° F. and 425° F., utilizing a mole ratio of calcium alkoxyalkoxide to said alkylphenol of from 0.5:1 to 0.6:1;

(2) introducing into contact with the resulting reaction mixture, sulfur in the presence of carbon dioxide at a temperature of from 410° F. to 450° F., utilizing a mole ratio of sulfur to initial alkylphenol of between 0.5:1 and 8:1, and a hydrocarbon lubricating oil, said hydrocarbon oil constituting between about 13 percent and 20 percent by weight of said reaction mixture; to effect incorporation in said alkylphenolate of from 2 percent to 6 percent by weight of sulfur to form sulfurized calcium alkylphenolate,

(3) forming a third reaction mixture by further introducing into said sulfurized calcium alkylphenolate a further addition of a calcium alkoxyalkoxide of said formula II in the presence of carbon dioxide at at temperature within said first temperature range in a mole ratio of 0.5:1 to 1:1 of said calcium alkoxyalkoxide to initial alkylphenol; and

(4) thereafter hydrolyzing said third reaction mixture to form a sulfurized overbased calcium alkylphenolate,

an overbased calcium hydrocarbyl sulfonate in which said hydrocarbyl moiety is derived from petroleum and said sulfonate has a molecular weight ranging from about 300 to 700 and having a TBN at least 50,

said sulfurized overbased calcium alkylphenolate and said overbased calcium hydrocarbyl sulfonate being employed at a concentration in said lubricating oil composition to give said lubricating oil composition an alkalinity expressed as total base number of at least 10;

an effective silver anti-wear amount of a second sulfurized additive composition comprising a sulfurized naphthenic hydrocarbon lubricating oil wherein combined sulfur is present within a range of about 1 percent to about 6 percent by weight, and

a chlorinated paraffin having a molecular weight ranging from 500 to 1000 and containing elemental chlorine in combined form amounting to from about 40 to 60 percent by weight of said chlorinated paraffin.

4,171,270
SULFURIZED OVERBASED CALCIUM ALKYLPHENOLATE LUBRICANT COMPOSITION

Rodney L. Sung, Fishkill; Benjamin H. Zoleski, Beacon, both of N.Y.; Herbert C. Morris, Sugarland, Tex., and Elmer E. Schallenberg, Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,703
Int. Cl.[2] C10M *1/54, 3/48, 5/28, 7/52*
U.S. Cl. 252—42.7 **15 Claims**

1. A lubricating oil composition comprising:

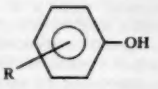
a hydrocarbon base oil of lubricating viscosity having an SUS viscosity at 100° F. of between about 50 and 250;

a sulfurized overbased calcium alkylphenolate having a calcium metal to alkylphenol ratio of at least 2.9:2, a calcium content by weight of the total composition of between 6 and 7.4 percent, and a sulfur content of between 0.5 percent and 12 percent of the total composition;

wherein said sulfurized overbased calcium alkylphenolate is produced by the step-wise process that comprises:

(1) introducing into contact with an alkylphenol of the formula:

(I)



wherein R is from 1 to 2 monovalent alkyl radicals, each

containing from 4 to 50 carbons, a calcium alkoxyalkoxide of the formula:

$$Ca\text{—}(\text{—O-A-OR}')_2 \qquad \text{(II)}$$

wherein A is an alkanediyl radical of from 1 to 6 carbon atoms, and R′ is an alkyl radical of from 1 to 25 carbon atoms, at a temperature between 200° F. and 425° F., utilizing a mole ratio of calcium alkoxyalkoxide to said alkylphenol of from 0.5:1 to 0.6:1;

(2) introducing into contact with the resulting reaction mixture, sulfur in the presence of carbon dioxide at a temperature of from 410° F. to 450° F., utilizing a mole ratio of sulfur to initial alkylphenol of between 0.5:1 and 8:1, and a hydrocarbon lubricating oil, said hydrocarbon oil constituting between about 13 percent and 20 percent by weight of said reaction mixture; to effect incorporation in said alkylphenolate of from 2 percent to 6 percent by weight of sulfur to form sulfurized alkylphenolate,

(3) forming a third reaction mixture by further introducing into said sulfurized alkylphenolate a further addition of a calcium alkoxyalkoxide of said formula II in the presence of carbon dioxide at a temperature within said first temperature range in a mole ratio of 0.5:1 to 1:1 of said calcium alkoxyalkoxide to initial alkylphenol; and

(4) thereafter hydrolyzing said third reaction mixture; said sulfurized overbased alkylphenolate being employed at a concentration in said lubricating oil composition to give said lubricating oil composition an alkalinity expressed as total base number of at least 10; and

an effective silver anti-wear amount of a second sulfurized additive composition comprising a sulfurized naphthenic hydrocarbon lubricating oil wherein combined sulfur is present within a range of about 1 percent to about 6 percent by weight.

4,171,271

THIOBISPHENOL ESTERS OF PENTAVALENT PHOSPHORUS ACIDS IN FUNCTIONAL FLUIDS

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 598,297, Jul. 23, 1975, Pat. No. 4,051,201, which is a continuation of Ser. No. 26,060, Apr. 6, 1970, abandoned. This application Jun. 6, 1977, Ser. No. 803,709

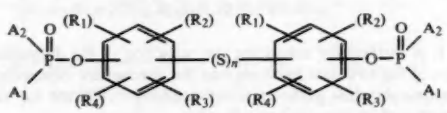
Int. Cl.[2] **C10M** *1/48, 3/42, 5/24;* **C09K** *5/00*

U.S. Cl. 252—46.6 **4 Claims**

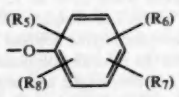
1. A functional fluid composition comprising:

(a) A base-stock selected from the group consisting of petroleum oils, synthetic ester fluids, triaryl phosphates, polyphenyl ethers, and mixtures thereof; and

(b) About 0.1 to about 2.0 percent by weight of the total fluid of a thiobisphenol phosphorus acid ester represented by the formula:



wherein A_1 and A_2 can be alike or different and can be alkyl, alkoxy, alkaryl, aryl, haloaryl, arylalkyl, aryloxy, alkaryloxy, alkoxyaryl, chlorine, bromine, or

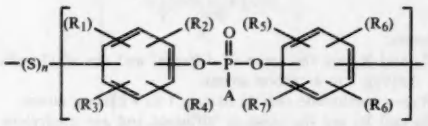


R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are independently selected chemically non-interfering substituents attached to the aromatic ring and are selected from the group alkoxy, haloaryl, aryloxy, alkaryloxy, and halogen, and n is an integer having a value of from 1 to about 6 inclusive.

3. A functional fluid composition comprising:

(a) A base-stock selected from the group consisting of petroleum oils, synthetic ester fluids, triaryl phosphates, polyphenyl ethers, and mixtures thereof; and

(b) About 0.1 to about 2.0 percent by weight of the total fluid of a polymeric composition of the repeating unit:



wherein A is aryloxy, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are independently selected from the group consisting of hydrogen and halogen, and n is an integer having a value of from 1 to about 2.

4,171,272

TURBINE LUBRICANT

R. Martin Wright, Cherry Hill, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 2, 1977, Ser. No. 856,866

Int. Cl.[2] **C10M** *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—46.7 **10 Claims**

1. A fire resistant lubricant composition comprising a liquid mixed isopropylphenyl/phenyl phosphate base oil and in admixture therewith from about 0.01 to 0.1 weight percent benzotriazole; an effective amount not less than about 0.01 weight percent of a mixed mono- and dialkyl phosphate of the formula RH_2PO_4 and R_2HPO_4 wherein R is an alkyl group of 8-12 carbon atoms; and from about 0.0025 to about 0.2 weight percent of an antioxidant selected from the group consisting of a C_{12} to C_{18} alcohol ester of 3,3′-thiodipropionic acid; pentaerythritol tetra(3,5-di-tert-butyl-4-hydroxyphenyl)propionate, and 4,4′-thiobis-(3-methyl-6-tertbutylphenol).

4,171,273

FATTY ALKYL SUCCINATE ESTER AND SUCCINIMIDE MODIFIED COPOLYMERS OF ETHYLENE AND AN ALPHA OLEFIN

James O. Waldbillig, and Isaac D. Rubin, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,243

Int. Cl.[2] **C08G** *9/04, 37/32*

U.S. Cl. 252—51.5 A **65 Claims**

1. A method of preparing a fatty alkyl succinate ester and succinimide modified copolymer of ethylene and an alpha olefin comprising:

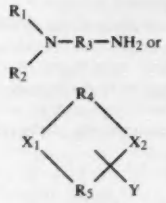
(a) reacting said ethylene-alpha-olefin copolymer with maleic anhydride in the presence of a free radical initiator and a solvent for the reaction mixture to produce a resulting succinic anhydride derivative of said ethylene-alpha-olefin copolymer,

(b) adding an inert liquid diluent to the resulting reaction mixture containing said succinic anhydride derivative,

(c) removing remaining maleic anhydride and solvent from the resulting reaction mixture,

(d) reacting the succinic anhydride derivative with a n—C_4 to n—C_{22} alcohol or mixtures thereof in the presence of an acidic catalyst to produce the corresponding succinate ester,

(e) reacting unesterified carboxylic acid or anhydride groups of said copolymer derivative with a polyamine having the formula:



wherein

R_1 and R_2 are the same or different and are alkyl radicals having 1 to 4 carbon atoms;

R_3 is a methylene radical having 1 to 4 carbon atoms;

R_4 and R_5 are the same or different and are methylene or methine radicals having 1 to 4 carbon atoms;

X_1 is O, S, NH, N—R_1, or CH_2 (if R_4 and R_5 are methylene radicals) or N or CH (if R_4 and R_5 are methine radicals);

X_2 is N or NH and

Y is NH_2 or R_3—NH_2 to produce the corresponding fatty alkyl succinate ester and succinimide modified copolymers of ethylene and alpha olefin.

4,171,274

ALTERATION OF TESSELATED MAGNETIC PARTICLES BY FRACTURE

William M. Schwarz; Robert S. Karz; Peter F. Erhardt, all of Webster, and Charles G. Dickerson, Farmington, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 7, 1977, Ser. No. 813,602

Int. Cl.[2] G03G *9/08*

U.S. Cl. 252—62.1 P **7 Claims**

1. A carrierless developer consisting essentially of toner particles, the toner particles comprising resin and magnetic particles wherein the magnetic particles are concentrated at the surface of the toner particles, the surface being altered to remove small amounts thereof to expose the inner portion of said toner particles, the altered particles having a minimum fuse temperature greater than 10° F. below the fuse temperature of the unaltered particles.

4,171,275

LIQUID ELECTROGRAPHIC DEVELOPER

Stewart H. Merrill; Alec N. Mutz, and Frederick A. Stahly, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1977, Ser. No. 824,131

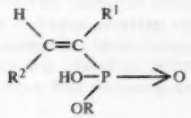
Int. Cl.[2] G03G *9/12*

U.S. Cl. 252—62.1 L **5 Claims**

1. An electrographic developer composition comprising an electrically insulating carrier liquid having dispersed therein

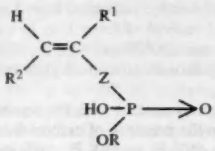
(1) an addition polymer comprising a polar moiety and at least one additional moiety having predetermined solubility characteristics with respect to the carrier liquid, said polar moiety being selected from the group consisting of (a) sulfoalkyl acrylates, (b) sulfoalkyl methacrylates, (c) metal salts of sulfoalkyl acrylates, (d) metal salts of sulfoalkyl methacrylates, (e) amine salts of sulfoalkyl acrylates, (f) amine salts of sulfoalkyl methacrylates, (g) metal salts of acrylic cid and methacrylic acids and (h) amine salts of acrylic and methacrylic acids, and mixtures thereof;

(2) a soluble phosphonic moiety-containing polymer having repeating units derived from a monomer of the formula:



-continued

or



wherein:

R is hydrogen, an alkyl group or an aryl group;

R^1 is hydrogen or a lower group having from 1 to about 4 carbon atoms;

R^2 is hydrogen or an alkyl group; and

Z is alkylene, arylene or alkylene-arylene; the solubility ratio of said soluble phosphonic moiety-containing polymer being at least about 0.825; and

(3) a halogenated polymer.

4,171,276

DUST SUPPRESSION METHOD AND COMPOSITION

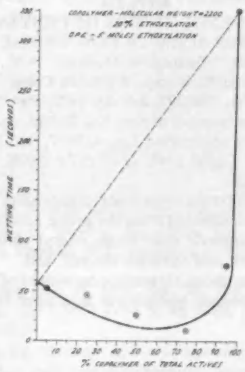
Gary A. Brehm, Churchville, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 769,087, Feb. 16, 1977, Pat. No. 4,136,050. This application Oct. 16, 1978, Ser. No. 951,435

The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.

Int. Cl.[2] C09K *3/22*

U.S. Cl. 252—88 **11 Claims**


COPOLYMER - MOLECULAR WEIGHT = 2200
20% ETHOXYLATION
DPE = 5 MOLES ETHOXYLATION
WETTING TIME (SECONDS)
% COPOLYMER OF TOTAL ACTIVES

1. A method for enhancing the reduction of the dissemination of fugitive dust particles into the atmosphere comprising wetting the dust particles with an effective amount for the purpose of an aqueous solution of:

(i) alkylphenoxy polyethoxy ethanol wherein the alkyl group has from 7 to 10 carbon atoms, and

(ii) copolymer of ethylene oxide and propylene oxide, wherein the weight ratio of the ethanol compound to the copolymer is from about 5/95 to 95/5, wherein the copolymer has a molecular weight of from about 1000 to 16,000 and an ethylene oxide content of from about 10% to 80%, wherein the ethanol compound has from about 5 to 40 moles of ethylene oxide, and wherein the total concentration of the ethanol compound and the copolymer in the aqueous solution is from about 0.005% to 6%, whereby the combination of components (i) and (ii) unexpectedly enhances the wetting of the dust particles.

4,171,277

GRANULATED COMPOSITION COMPRISING A POLYMER PHOSPHATE AND AN ALKALI METAL ALUMINUM SILICATE, PROCESS OF MAKING AND METHOD OF USING SAME

Jüergen Dankworth, Bensheim; Helmut Hartenstein, Ruelzheim, and Ludwig Hertling, Biblis, all of Fed. Rep. of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Mar. 31, 1978, Ser. No. 892,209

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714604

Int. Cl.[2] C01B *33/28;* **C02B** *1/44;* **C11D** *3/12, 11/00*

U.S. Cl. 252—99 **13 Claims**

1. An agglomerate composition comprising a highly condensed polymer phosphate of the formula

$$Me^{I}_{(n+2)}P_nO_{(3n+1)}$$

wherein n represents one of the numerals 4 to 50, and

Me^{I} represents an alkali metal cation or ammonium, and an ion-exchanging alkali metal aluminum silicate, in a by-weight ratio of highly condensed polymer phosphate to alkali metal aluminum silicate of from about 2:1 to about 1:2.

4,171,278

SURFACE-ACTIVE COMPOUND COMBINATION CONTAINING HYDROXYALKYLAMINES

Hans Andree; Günter Jakobi, both of Hilden; Wolfgang Rupilius, Düsseldorf; Horst Rutzen, Langenfeld; Ulrich Zeidler, Düsseldorf; Markus Berg, Düsseldorf; Jochen Kaufmann, Düsseldorf, and Gunther Vogt, Tonisvorst, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 784,739, Apr. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 766,626, Feb. 7, 1977, abandoned. This application Nov. 2, 1978, Ser. No. 941,902

Claims priority, application Austria, Feb. 6, 1976, 84076/76; May 3, 1976, 3234/76; Nov. 2, 1976, 8088/76; Nov. 11, 1976, 8373/76

Int. Cl.[2] C11D *1/44*

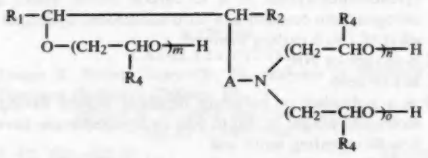
U.S. Cl. 252—102 **29 Claims**

1. A surface-active compound combination for use in textile washing agent compositions consisting essentially of

(1) at least one tenside selected from the group consisting of anionic surface-active compounds of the sulfonate and sulfate type and nonionic surface-active compounds of the ethoxylated higher alkanols, higher alkenols, higher alkanediols and higher alkylphenols, and

(2) at least one hydroxyalkyl compound selected from the group consisting of

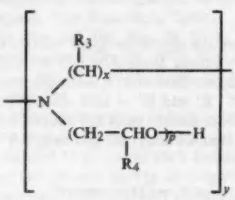
(A) hydroxyalkyl amines of the formula



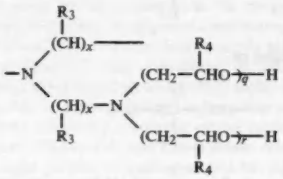
wherein R_1 is alkyl having 1 to 16 carbon atoms, R_2 is a member selected from the group consisting of hydrogen and alkyl having 1 to 16 carbon atoms, and the sum of the carbon atoms in R_1+R_2 is from 6 to 20 with the proviso that when R_2 is H, R_1 is alkyl having 6 to 16 carbon atoms, R_4 is a member selected from the group consisting of hydrogen and methyl, m, n and o represent integers from 0 to 3 and A is a bridging bond selected from the group consisting of:

(a) a single bond between the carbon and the nitrogen,

(b)

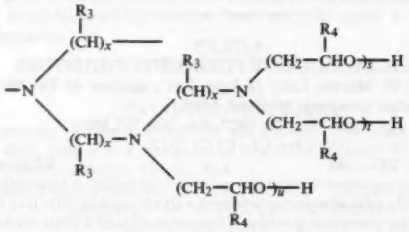


(c)



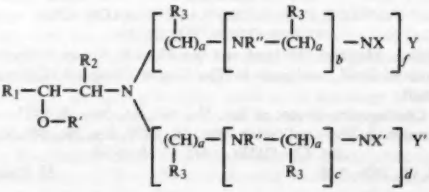
and

(d)

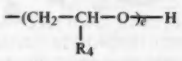


wherein R_3 is a member selected from the group consisting of hydrogen and methyl, x is an integer from 2 to 6, y is an integer from 1 to 3, p, q, r, s, t, and u represent integers from 0 to 3, with the provisos (a) that when A is a single bond between the carbon and the nitrogen, R_2 is alkyl having 1 to 16 carbon atoms and m is 0, and (b) that when A is other than a single bond between the carbon and the nitrogen, the sum of m to u is from 1 to 5.5 and

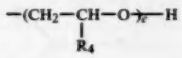
(B) acylated hydroxyalkyl amines of the formula



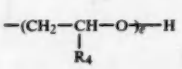
wherein R_1, R_2 and R_3 have the above-assigned values, X and X′ are each members selected from the group consisting of hydrogen and



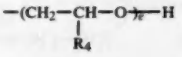
wherein R_4 has the above-assigned value and e is an integer from 1 to 3, Y, Y′, R′ and R″ are each members selected from the group consisting of hydrogen, alkanoyl having from 1 to 12 carbon atoms in the alkane, hydrocarbon aroyl having from 7 to 12 carbon atoms and



where R_4 and e have the above-assigned values, a is an integer from 2 to 6, b is an integer from 0 to 2, c is an integer from 0 to 1, d and f are integers from 0 to 1, with the provisos (d) that at least one of Y, Y', R' and R'' is said alkanoyl or said aroyl, (e) that the sum of b, c, d and f does not exceed 3, (f) that when d and f are 0, Y is said alkanoyl or said aroyl, Y' is



and R' is hydrogen or



wherein the amount of component (1) to component (2) is in the weight ratio of 100:1 to 1:1.

4,171,279

POLYGLYCOLAMINE CORROSION INHIBITORS

Charles W. Martin, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 14, 1977, Ser. No. 777,190
Int. Cl.[2] C11D *7/32*
U.S. Cl. 252—148 **8 Claims**

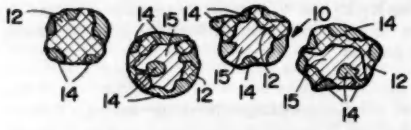
1. An aqueous nonoxidizing acid composition consisting essentially of said aqueous acid and a small amount effective to inhibit the corrosion thereby of ferrous metals of a poly(lower-)alkyleneglycolamine of about 300 to about 5000 average molecular weight wherein said poly(lower)alkyleneglycolamine is at least one of an aminated polyalkylene glycol wherein the alkylene moieties are substantially all of 3–4 carbon atoms or the condensation product of propylene oxide, butylene oxide, or a mixture of said oxides with a lower alkanolamine or a primary or secondary nonaromatic amine which is an alkylamine wherein alkyl is of 1–8 carbon atoms, an alicyclic amine, or an oxygen or nitrogen heterocyclic amine wherein the alicyclic or heterocyclic ring is of 5–6 atoms.

4,171,280

POWDER PERCARBONATE BLEACH AND FORMATION THEREOF

Lodric L. Maddox, Oakland, and Soo-Duck P. Moon, Fullerton, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 848,216, Nov. 3, 1977, abandoned. This application Mar. 14, 1978, Ser. No. 886,662
Int. Cl.[2] C11D *3/395, 7/18, 7/54*
U.S. Cl. 252—186 **33 Claims**



1. A process for making a separation resistant dry bleach composition, comprising:

contacting particulate soda ash with sufficient of a spray of an aqueous solution of hydrogen peroxide, said contacting being at a temperature which falls within a range from about 35° C. to about 70° C. to provide a dry bleach composition having sufficient sodium percarbonate to provide available oxygen in an amount of from about 1 to about 6 weight percent of said composition and a remainder which comprises soda ash; and

recovering said dry bleach composition from said contacting step.

4,171,281

GRAPHITIZATION AND REDUCING CHARGE

Pavel N. Galkin, ulitsa 40 let Sovetskoi Ukrainy, 78, kv. 32; Boris V. Komarov, prospekt Lenina, 159, kv. 45; Leonid P. Khlopkov, ulitsa 40 let Sovetskoi Ukrainy, 24, kv. 11; Eduard V. Gorbatenko, ulitsa 40 let Sovetskoi Ukrainy 62, kv. 125; Boleslav D. Luttsev, bulvar Tsentralny, 3, kv. 10; Nikolai A. Kiprich, ulitsa Rekordnaya, 32, kv. 8; Alexandr A. Rogatkin, ulitsa 40 let Sovetskoi Ukrainy, 7, kv. 3; Grigory I. Silakov, ulitsa Yatsenko, 4a, kv. 59; Nikolai V. Galitsky, prospekt Mayakovskogo, 3a, kv. 13; Arkady G. Sasin, ulitsa Gorkogo, 169, kv. 117; Mark I. Miloslavsky, prospekt Lenina, 190, kv. 50; Stanislav I. Gashenko, ulitsa Gorkogo, 159, kv. 76; Lidia I. Lekalova, ulitsa 40 let Sovetskoi Ukrainy, 58, kv. 39, and Mikhail N. Bystrenin, ulitsa Rekordnaya, 4a, kv. 27, all of Zaporozhie, U.S.S.R.

Filed Feb. 3, 1978, Ser. No. 875,073
Int. Cl.[2] C01B *31/02, 31/04*
U.S. Cl. 252—188 **2 Claims**

1. A charge for use in graphitization furnaces, composed of 85 to 95 percent by mass of: coke with not less than 90 percent by volume of size fraction 0.5 to 2 mm and not more than 10 percent by volume of size fraction 2 to 10 mm; and of 5 to 15 percent by mass of sawdust.

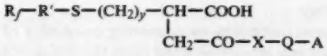
4,171,282

FLUORINATED NONIONIC SURFACTANTS

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1977, Ser. No. 858,218
Int. Cl.[2] B01F *17/36;* C07C *69/40*
U.S. Cl. 252—356 **8 Claims**

1. Perfluorinated substituted half esters and amides having the formula



wherein

R_f is straight or branched chain perfluoroalkyl of 4 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms;

R_1 is branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms or alkyleneiminoalkylene of 2 12 carbon atoms where the nitrogen atom contains as a third substituent, hydrogen or alkyl of 1 to 6 carbon atoms;

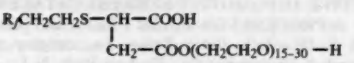
X is oxygen or NH;

Y is 1 or zero;

Q is a polyether or polyester diradical moiety having a molecular weight of 300 to 500, or a polysiloxane having 5 to 80 repeating units; and

A is hydrogen, hydroxyl, alkoxy of 1 to 21 carbon atoms, phenoxy, alkylphenoxy of 7 to 12 carbon atoms, or the group

8. A mixture of compounds of claim 1 having the formula



wherein R_f has a distribution of 27% (±5%) C_6, 50% (±5%) C_8 and 23% (±5%) C_{10}.

4,171,283

HEMOPERFUSION ADSORBENTS

Toshihide Nakashima, Kurashiki, and Koichi Takakura, Okayama, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

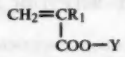
Filed Jul. 29, 1977, Ser. No. 820,380

Claims priority, application Japan, Aug. 4, 1976, 51-93746; Sep. 24, 1976, 51-114092; Feb. 18, 1977, 52-17394

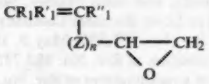
Int. Cl.[2] B01D *11/04*

U.S. Cl. 252—428 **7 Claims**

1. A hemoperfusion adsorbent comprising an adsorbent material containing at least one coating thereon of a hydrophilic polymer prepared by the polymerization of at least one monomeric acrylate or methacrylate represented by the formula:



wherein Y is a radical selected from the group consisting of $-R_2-OR_3$ and $-R_2-NR_3R'_3$, R_1 is hydrogen or methyl, R_2 is a divalent alkylene radical containing 2 to 3 carbon atoms or a poly(oxyalkylene) radical, and R_3 and R'_3, respectively, are hydrogen or an alkyl group containing 1 to 3 carbon atoms which can be substituted with polar radicals, with a copolymerizable monomer containing an epoxy moiety therein represented by the formula:



wherein Z is a divalent radical selected from the group consisting of $-COO-R_2-$ and $-CH_2-OCH_2-$, n is 0 or 1, R_1, R'_1 and R''_1 are each, respectively, hydrogen or methyl and R_2 is a divalent alkylene radical containing 1 to 3 carbon atoms or a poly(oxyalkylene) radical, wherein the feed ratio of the copolymerizable monomer containing an epoxy moiety therein in the polymerization ranges from 0.1 to 10% based on the weight of total monomers.

4,171,284

CATALYST SYSTEM

Nikolaus K. Balint, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 27, 1978, Ser. No. 881,828

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B **22 Claims**

1. A catalyst composition for the polymerization of propylene or mixtures of propylene and copolymerizable alpha-olefins, which produces low amounts of n-hexane-soluble polymer, comprising a titanium trihalide; an organoaluminum compound selected from the group consisting of dialkyl aluminum halide, trialkyl aluminum, a mixture thereof, and a mixture of trialkyl aluminum with alkyl aluminum dihalide; and a hexavalent sulfur mineral acid or anhydride in a molar ratio to titanium trihalide from about 0.005 to 1 to about 0.7 to 1.

4,171,285

SULFUR-REACTIVE CONTACT MATERIAL HAVING IMPROVED DIFFUSION CHARACTERISTICS

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 727,488, Sep. 28, 1976, Pat. No. 4,113,606. This application May 18, 1978, Ser. No. 907,231

Int. Cl.[2] B01J *29/06, 23/84*

U.S. Cl. 252—455 R **7 Claims**

1. A composition comprising a rigidly interconnected pack of irregularly shaped particles sized in the average diameter range below about 0.15 mm, said pack having a pore volume of at least 0.15 cc per cc and having throughout the pack access channels among said particles, said channels comprising interconnected pores having diameters in the range of from about 0.1 to about 15 microns, said pores contributing at least about 5 percent of said pore volume; said particles being of the same or different materials and comprising at least one material selected from the group consisting of (1) sulfur-reactive agents, (2) composites of said agents and at least one refractory oxide selected from the group consisting of the oxides of the metals of Groups II, III and IV; said composition containing at least about 1 weight percent of said agent and having a surface area in the range of from about 2 to 700 square meters per gram.

2. A composition as in claim 1 wherein said refractory oxide is catalytic cracking catalyst fines and said agent is copper chromite.

4,171,286

CATALYTIC CRACKING

Lawrence B. Dight, Plainfield, and James V. Kennedy, Westfield, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Continuation of Ser. No. 757,828, Jan. 10, 1977, abandoned. This application Nov. 8, 1978, Ser. No. 958,550

Int. Cl.[2] B01J *29/06, 29/12*

U.S. Cl. 252—455 Z **7 Claims**

1. An article of manufacture consisting essentially of calcined spray dried microspheres of kaolin clay impregnated with a minor amount of a platinum compound, the platinum compound being present in amount sufficient to promote the oxidation of carbon monoxide to carbon dioxide in a regenerator for a fluid cracking catalyst, said impregnated microspheres having a low surface area as measured by the B.E.T. nitrogen absorption method.

5. A cracking catalyst composition consisting essentially of a physical mixture of 70 to 95 parts by weight of particles of a zeolitic aluminosilicate fluid cracking catalyst free from a noble metal and from 30 to 5 parts by weight of particles of spray dried kaolin clay in the form of microspheres, said microspheres having been calcined at a temperature in the range of about 1000° to 2100° F., having a surface area, as measured by the B.E.T. nitrogen absorption method, in the range of about 10 to 15 $m^2/g.$, a pore volume, as measured by nitrogen absorption, in the range of about 0.02 to 0.04 cc./gm. and a particle size distribution such that the particles are predominantly in the size range of 20 to 150 microns, said calcined microspheres having impregnated thereon a compound of platinum in amount sufficient to promote the oxidation of carbon monoxide to carbon dioxide in a regenerator for a fluid cracking catalyst.

4,171,287

CATALYST COMPOSITIONS AND THE METHOD OF MANUFACTURING THEM

Carl D. Keith, Summit, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Sep. 23, 1977, Ser. No. 836,108

Int. Cl.[2] B01J *23/10, 23/64, 23/74, 21/04*

U.S. Cl. 252—462 **40 Claims**

1. A method of manufacturing a catalyst composition having a catalytically-promoting material on a solid, macrosize car-

rier, said catalytically promoting material comprising a platinum group metal component containing one or both of platinum and palladium, and a solid, finely-divided base metal component containing one or more base metals having an atomic number from 25 to 28 and rhenium, and a solid, finely-divided alumina support, said base metal component being present in said catalyst composition in an amount greater than said platinum group metal component, the method including the steps of combining said support with one or more compounds of a platinum group metal, including at least one of platinum and palladium, while said compounds are contained in the same or different liquids, heating said alumina support after the aforesaid combining at a temperature sufficiently high to provide thereon said platinum group metal component maintaining at least a major amount of said base metal component in solid form throughout the manufacture of said catalyst composition, depositing said solid, finely-divided base metal component and said solid, finely-divided support on said carrier by forming a slurry or slurries of said support and of said base metal component in a liquid and contacting said carrier with a slurry or slurries of said solids in liquid, said solids being in either the same or different slurries, and drying said support after said contacting of said support with said slurry or slurries.

4,171,288

CATALYST COMPOSITIONS AND THE METHOD OF MANUFACTURING THEM

Carl D. Keith, Summit; William R. Larsen, Fords, and Thomas Shimrock, Chatham, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Sep. 23, 1977, Ser. No. 836,649

Int. Cl.[2] B01J *21/04, 23/10, 23/64, 23/74*

U.S. Cl. 252—462 **31 Claims**

1. A catalyst composition having a catalytically-promoting material comprising an alumina support, a catalytically-promoting, base metal component, the base metal of which is selected from the group consisting of base metals having an atomic number from 25 to 28 and rhenium, and a catalytically-promoting, platinum group metal component, said catalytically-promoting material being deposited on a particulate, macrosize, solid carrier having a surface area of at least about 50 square meters per gram, and said base metal component being present in said catalyst composition in an amount greater than said platinum group metal component, said catalyst composition being prepared by combining said platinum group metal component, said base metal component, and said alumina support on said carrier, said platinum group metal component being combined with said support by contacting said support in solid, finely divided form with a liquid containing therein at least one compound of a platinum group metal, and said base metal component being combined with said support by at least one of (1) admixing finely divided particles of a solid compound of at least one base metal with said solid, finely divided alumina support and (2) contacting said support with a liquid containing therein at least one compound of said base metal, which liquid may be the same or different from that which contains said compound of said platinum group metal, heating said alumina support, after the aforesaid contacting with said liquid or liquids containing said platinum group metal and, optionally, said base metal compound or compounds, at a temperature sufficiently high to provide thereon said platinum group metal component and, optionally, said base metal component, forming a mixture of said solid, finely divided alumina support and a liquid, forming in a gaseous medium dispersed particles of said mixture containing said liquid and said solid, finely divided alumina support, contacting said dispersed particles with said particulate solid carrier to deposit said alumina support on said carrier, and drying said particulate carrier so coated with said alumina support.

4,171,289

SELECTIVE AUTOMOTIVE EXHAUST CATALYSTS AND A PROCESS FOR THEIR PREPARATION

Kenneth S. Wheelock, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 2, 1977, Ser. No. 856,930

Int. Cl.[2] B01J *21/04, 23/42, 23/44, 23/46*

U.S. Cl. 252—466 PT **20 Claims**

1. In a process for the preparation of an automotive emission control catalyst comprising a dried, calcined composite of one or more Group VIII noble metals and an inorganic oxide support useful for contacting the fume from a combusting sulfur containing gasoline for oxidation of the sulfur dioxide, carbon monoxide and hydrocarbons contained therein, the improvement which comprises maintaining the surface acidity of said support at from about 0.001 to about 0.2 micromoles pyridine/m^2 while contacting and impregnating said support with a solution which contains a compound of said noble metal, or metals, prior to drying and calcining said catalyst.

4,171,290

CATALYST FOR SELECTIVE HYDROCRACKING OF ALKYLBENZENES

Rodney L. Mieville, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 899,313

Int. Cl.[2] B01J *21/04, 23/60*

U.S. Cl. 252—466 PT **4 Claims**

1. A catalyst composition comprising highly purified alumina containing essentially no silica with a surface area of at least 100 m^2/g, up to 5 wt. percent rhodium zinc oxide wherein, up to 10 wt. percent zinc is present, expressed as the metal, and wherein the said alumina comprises at least one member selected from the group consisting of gamma alumina and eta alumina.

4,171,291

PROCESS FOR PREPARING ALKANE SULFONATE DETERGENT COMPOSITIONS

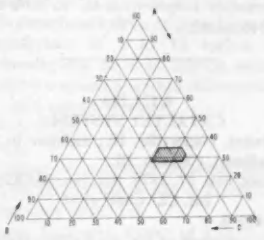
Virender N. Malhotra, and John Mather, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 683,591, May 5, 1976, abandoned, which is a continuation of Ser. No. 583,732, Jun. 5, 1975, abandoned, which is a continuation of Ser. No. 393,386, Aug. 31, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,547

Claims priority, application United Kingdom, Sep. 6, 1972, 41246/72

Int. Cl.[2] C11D *1/14, 11/04*

U.S. Cl. 252—554 **8 Claims**



1. A method of preparing alkane sulphonates by reacting an olefin having a carbon chain length of from 8 to 20 with bisulphite ions in a liquid medium, in the presence of a substance known to initiate said reaction, comprising the steps of:

(i) forming a mixture of olefin and a co-solvent consisting of water and a short chain alcohol containing from 1 to 4 carbon atoms wherein the alcohol forms from about 58% to about 70% by weight of the co-solvent and the alcohol

is present in an amount of from about 50% to about 100% by weight of the olefin, and

(ii) adding an aqueous solution of bisulphite ions to the mixture until there is an excess in the reaction zone of from 0.1 to 0.2 mols of bisulphite ions per mol of olefin and the alcohol being present in an amount from about 16% to about 19% by weight in the final reaction mixture, said bisulphite ions having a strength of more than about 90% of the saturated value, containing not more than 14 mol % of sulphite ions, relative to bisulphite and sulphite combined; adding sulphur dioxide to form bisulphite ions from the sulphite ions.

4,171,292

COMPOSITIONS FOR TREATING AQUEOUS MEDIUMS CONTAINING MAGNESIUM SULFITE TRIHYDRATE

Robert L. Jones, Hingham, Mass.; Lewis Volgenau, Ivyland, and Philip S. Davis, Furlong, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 711,915, Aug. 5, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,696

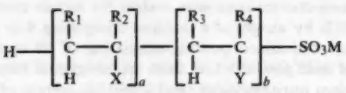
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.

Int. Cl.[2] **C02B** *5/06;* **C08L** *41/00*

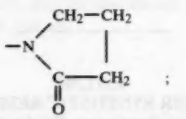
U.S. Cl. 260—29.6 WB **14 Claims**

1. A composition comprising in combination:

(i) oligomer having the formula

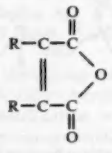


where R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, methyl and ethyl; Y is at least one member selected from the group consisting of —COOH, —COOM, —$CONH_2$, —OCH_3, —OC_2H_5, —CH_2OH, and



X is one or more members selected from the group consisting of —$COOC_2H_4OH$, —$COOC_3H_6OH$, —$CONHCH_2OH$, —$CONHCH_3$, —$CONHC_2H_5$, —$CONHC_3H_7$, —$CONHC_8H_{17}$, —$COOCH_3$, —$COOC_2H_5$, —CN, —$OOCCH_3$, —$OOCC_2H_5$, and —$CONHC(CH_3)_2CH_2COCH_3$; a+b is 4 to 250; a/(a+b) is between 0.0 and 0.6; and M is a water soluble cation of a bisulfite salt;

(ii) an effective metal salt of a copolymer of 1-olefin having from 4 to 16 carbon atoms and a compound having the formula:



where R is individually selected from the group consisting of hydrogen, methyl and ethyl; and

(iii) aqueous medium containing magnesium sulfite trihydrate under precipitating conditions.

4,171,293

AQUEOUS DISPERSIONS OF ALKYD AND/OR AMINO RESINS CONTAINING AMINE OXIDES

Helmut Eschwey, Odenthal; Wolf-Dieter Willmund, Düsseldorf, and Wolfgang Gress, Wuppertal-Elberfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgsellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,546

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1977, 2711000

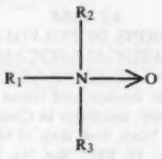
Int. Cl.[2] **C09D** *3/50, 3/52, 3/64, 3/66*

U.S. Cl. 260—22 A **15 Claims**

1. an aqueous disperson of resins suitable as a coating agent or varnish binding agent, comprising a content of

(a) from 30% to 70% by weight, based on the total weight of the aqueous dispersion, of crosslinkable resins selected from the group consisting of alkyd resins, aminoplast resins and mixtures thereof, and

(b) from 0.5% to 10% by weight, based on the weight of said resins, of a surface-active amine oxide having the formula



wherein R_1 is a hydrocarbon radical having 8 to 30 carbon atoms, which is selected from the group consisting of an aliphatic radical, a cycloaliphatic radical, and an aliphatic or cycloaliphatic radical which is substituted by a member selected from the group consisting of 1 to 3 ether groups, 1 to 4 hydroxyl groups, and mixtures thereof, and R_2 and R_3 are independently a hydrocarbon radical having 1 to 16 carbon atoms, which is selected from the group consisting of an aliphatic radical, a cycloaliphatic radical, and an aliphatic or cycloaliphatic radical which is substituted by a member selected from the group consisting of 1 to 3 heteroatoms, 1 to 4 hydroxyl groups and mixtures thereof, and

(c) an aqueous medium.

4,171,294

STOVING LACQUERS CONTAINING REACTIVE DILUENTS

Rolf Dhein; Peter Höhlein; Rolf Küchenmeister, and Wolfgang Beer, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,813

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712229

Int. Cl.[2] **C08L** *91/00;* **C09D** *3/52, 3/66*

U.S. Cl. 260—22 CQ **8 Claims**

1. A stoving lacquer comprising

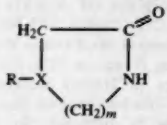
(A) from 40 to 94% by weight of

(a) an alkyd resin containing carboxyl groups and hydroxyl groups with an oil content of up to 40% by weight or

(b) an oil free polyester with an acid number of 1 to 100, an hydroxyl number of 30 to 400 and an average molecular weight between 400 and 10,000

(B) 5 to 40% by weight of an aminoplast resin

(C) 1 to 20% by weight of a reactive diluent which is a low viscosity water clear adduct obtained by dissolving or melting a lactam component and an hydroxy component at a temperature of 40° to 150° C. followed by agitation at said temperature for about 1 hour, said lactam component being of the formula



wherein X is nitrogen or CH, R is hydrogen, an aliphatic radical having 1 to 30 carbon atoms, an araliphatic radical having 3 to 12 carbon atoms, a pyridine radical, or a pyridine radical substituted by one or more C_1–C_4 alkyl radicals and m is an integer from 1 to 9 and said hydroxy compound being a 1 to 24 carbon atom aliphatic, cycloaliphatic and/or aromatic alcohol with 2 to 6 hydroxyl groups bonded to non-aromatic carbon atoms, said lactam component and said hydroxyl component having a molar ratio of n:1 wherein n is a value of from 1/20 to 10 and

(D) 0 to 35% by weight of an organic solvent, the aforesaid percentages by weight being based on the sum of components (A), (B) and (C).

4,171,295

AQUEOUS EMULSIONS OF POLYOLEFINS/BITUMEN PLASTIC OR PLASTIC-ELASTIC MATERIALS AND PROCESS FOR THE PRODUCTION THEREOF

Albert Frese; Hermann Roeben, and Horst Denzel, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,617

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649373

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23 H **19 Claims**

1. A composition comprising:

(a) 5–30% by weight of an extensively amorphous poly-α-olefin mixture having viscosity numbers J of 5–400 cc./g. and ether soluble proportions of more than 60%;

(b) 5–40% by weight of a hydrocarbon oil;

(c) 10–40% by weight of a bitumen;

(d) 0–10% by weight of a chlorinated paraffin having a chlorine content of 45–60%, an aromatic bromine compound or a mixture thereof;

(e) 0–20% by weight of an additive conventional in bitumen emulsions selected from fillers, stabilizers and flameproofing agents;

(f) 2–15% by weight of a surfactant; and

(g) 15–78% by weight of water.

4,171,296

METHOD OF HYDROLYZING POLYACRYLAMIDE

Lawrence J. Connelly, Oak Lawn, and Edward G. Ballweber, Glenwood, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 912,652, Jun. 5, 1978, which is a continuation-in-part of Ser. No. 840,446, Oct. 7, 1977, abandoned, which is a continuation of Ser. No. 705,652, Jul. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 514,961, Oct. 15, 1974, Pat. No. 3,998,777. This application Oct. 2, 1978, Ser. No. 947,905

Int. Cl.[2] C08L *33/26*

U.S. Cl. 260—29.6 WQ **11 Claims**

1. The method of hydrolyzing polyacrylamide which comprises the steps of:

A. Forming a polymeric latex comprising a water-in-oil emulsion which contains dispersed therein finely divided polyacrylamide and an organic surfactant which is alkali stable and will form a stable water-in-oil emulsion said polymeric latex comprising from 20 to 50% by weight of water, from 10 to 40% by weight of oil, and from 20 to 40% by weight polyacrylamide, and from 0.10 to 15% by weight of the alkali stable organic surfactant; and then,

B. Reacting said polymeric latex containing the organic stabilizer with an alkali metal hydroxide or quaternary ammonium hydroxide whereby a stable water-in-oil emulsion of finely divided hydrolyzed polyacrylamide is formed.

4,171,297

ANTI-CREVICE CORROSION SEALANTS FOR METALS

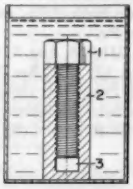
Nobuyoshi Hosaka, Minorimachi, and Tetsuo Nakazawa, Shimoinayoshi, both of Japan, assignors to Hitachi Ltd., Japan

Filed Sep. 8, 1977, Ser. No. 831,412

Claims priority, application Japan, Oct. 6, 1976, 51-119341

Int. Cl.[2] C08K *5/09*

U.S. Cl. 260—31.2 R **2 Claims**



1. An anti-crevice corrosion sealant for metals comprising: (a) 5 to 30% by weight of a material comprising 4 to 15 parts by weight of a mixed powder consisting of 99 to 80% by weight of zinc powder, 1 to 20% by weight of dicyclohexylammonium nitrite powder, and 1 part by weight of a vinyl silane coupling agent, and (b) 95 to 70% by weight of a film-forming polystyrene solution consisting of 5 to 40% by weight of a film-forming polystyrene and 95 to 60% by weight of ethyl acetate, whereby when said anti-crevice corrosion sealant is applied to a crevice, the particles of the zinc powder are encapsulated by polystyrene film, which film has micro-cracks formed therein as the solvent for the polystyrene dries up.

4,171,298

PHENOLIC ESTER SYNTHETIC RESIN STABILIZERS

Motonobu Minagawa, Koshigawa; Yutaka Nakahara, Iwatsuki, and Masayuki Takahashi, Tokorozawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

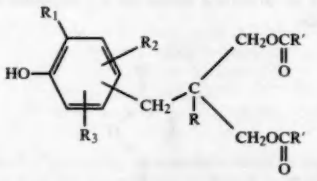
Filed Oct. 31, 1977, Ser. No. 846,721

Claims priority, application Japan, Nov. 1, 1976, 51/131362

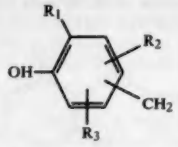
Int. Cl.[2] C08K *5/36;* **C07C** *65/04*

U.S. Cl. 260—45.85 H **15 Claims**

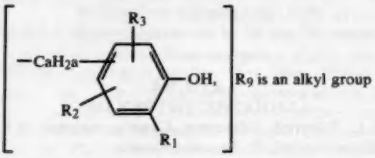
1. An ortho-alkylhydroxybenzylpropane-1,3-diol compound having the formula



in which R_1 is an alkyl group having 1 to 8 carbon atoms, R_2 and R_3 are hydrogen or alkyl groups having 1 to 8 carbon atoms, R is hydrogen, an alkyl group having 1 to 8 carbon atoms, an alkenyl group having 2 to 8 carbon atoms, or an ortho-alkylhydroxybenzyl group



and R′ is $—CH_2CH_2—S—R_9$ where



having 1 to 30 carbon atoms.

4,171,299

POLYPEPTIDE AGENTS FOR BLOCKING THE HUMAN ALLERGIC RESPONSE

Robert N. Hamburger, La Jolla, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 565,425, Apr. 4, 1975, abandoned. This application Jan. 27, 1976, Ser. No. 652,868

Int. Cl.[2] **C07C** *103/52*

U.S. Cl. 260—112.5 R **6 Claims**

1. The polypeptide which has the amino acid sequence Asp-Ser-Asp-Pro-Arg, and the pharmacologically acceptable salts and derivatives thereof.

4,171,300

PROCESS FOR THE MANUFACTURE OF METAL COMPLEX DYES

Peter Donath, Grenzach, and Gerhard Back, Lörrach, both of Fed. Rep. of Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 770,251, Feb. 18, 1977, abandoned, which is a continuation of Ser. No. 604,417, Aug. 13, 1975, abandoned. This application Apr. 3, 1978, Ser. No. 892,557

Int. Cl.[2] **C09B** *45/04, 45/14, 45/24, 45/34*

U.S. Cl. 260—145 B **14 Claims**

1. In the process of metallizing a metallizable dyestuff, in solution or suspension in water or organic solvent, by reaction of the dyestuff with a metal cation, in the presence of a complexing agent which prevents precipitation of the metal cation under the conditions of the metallization reaction, the improvement which comprises using less than a stoichiometric amount of the complexing agent and using as the complexing agent a poly(hydroxycarboxylate) which is a polymerized low molecular weight hydroxycarboxylic acid.

4,171,301

MONOAZO PIGMENTS CONTAINING BARBITURIC ACID DERIVATIVES

Rudolf Mory, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 612,591, Sep. 12, 1975, Pat. No. 4,028,322, which is a continuation-in-part of Ser. No. 379,527, Jul. 16, 1973, abandoned. This application Apr. 26, 1977, Ser. No. 791,112

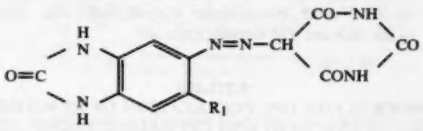
Claims priority, application Switzerland, Jul. 13, 1972, 10526/72

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.[2] **C09B** *29/36;* **C09D** *11/00;* **D06P** *1/08, 3/00*

U.S. Cl. 260—154 **3 Claims**

1. A compound of the formula



wherein R_1 denotes halogen, alkyl contain 1–4 carbon atoms or alkoxy containing 1–4 carbon atoms.

4,171,302

PROCESS FOR PRODUCING N-SUBSTITUTED AMIDES

Jean Abblard, Saint-Didier au Mont d'Or, and Michel Baudoin, Saint Fons, both of France, assignors to Philagro, France

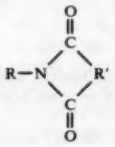
Filed Nov. 21, 1977, Ser. No. 853,501

Claims priority, application France, Nov. 22, 1976, 76 35864

Int. Cl.[2] **C07D** *205/10*

U.S. Cl. 260—239 A **29 Claims**

1. In a process of preparing an imide substituted on the nitrogen having the formula



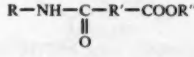
in which R is an alkyl radical containing 1 to 8 carbon atoms, or

an aryl radical having 1 or 2 phenyl rings bearing up to 5 substituents selected from the group consisting of 1 to 3 atoms of halogen, 1 to 2 nitro, amino, or hydroxy groups, 1 to 4 alkyl radicals, and 1 to 2 alkoxy or alkylthiol radicals, each containing 1 to 4 carbon atoms, or

a hexyl radical,

R′ is a single bond or a hydrocarbon chain containing from 1 to 4 carbon atoms, in which two contiguous carbons may belong to a phenyl ring, said hydrocarbon chain being saturated or unsaturated

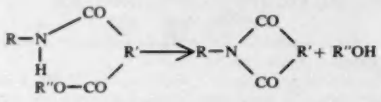
by cyclization of an amic acid of the formula:



in which

R and R′ have the same meaning as above and

R″ is a hydrogen atom, an alkaline metal atom, an ammonium group, or a lower alkyl having 1 to 4 carbon atoms, in accordance with the equation:



the improvement comprising carrying out the cyclization reaction in the presence of a mixed catalyst resulting from the association of the formula

A B

in which A is a strong inorganic or organic acid and B is a Lewis base selected from a member of the group consisting of monomethylformamide, dimethylformamide, monoethylformamide, dimethylacetamide, acetone, acetonitrile, N-methylpyrrolidone, dimethylsulfoxide, mesityl oxide, dioxane and tetrahydrofuran.

4,171,303

PROCESS FOR THE PREPARATION OF REACTIVE PENICILLANIC ACID AND CEPHALOSPORANIC ACID DERIVATIVES

Magda Huhn; Gabor Szabo; Gabor Resofszki, and Eva Somfai, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

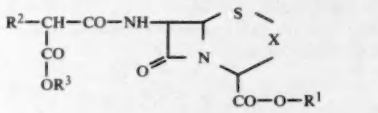
Continuation-in-part of Ser. No. 598,692, Jul. 24, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,735

Claims priority, application Hungary, Jul. 30, 1974, CI 1499

Int. Cl.[2] C07D *499/04, 501/04, 501/06*

U.S. Cl. 260—239.1 **9 Claims**

1. A process for the preparation of a compound of the formula I or a pharmaceutically acceptable salt thereof



(I)

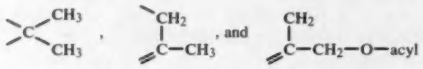
wherein

R^1 is hydrogen, a trialkylamino, trialkylsilyl, trichloroethyl, acetoxymethyl, conventional penicillin phenacyl, phenyl or a benzyl group,

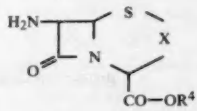
R^2 is hydrogen, alkyl, alkenyl, alkyl, having a conventional penicillin aryl heterocyclic substitutent, or a conventional penicillin aryl, aralkyl or heterocyclic group,

R^3 is hydrogen, aryl, alkyl, cycloalkyl or aralkyl, and

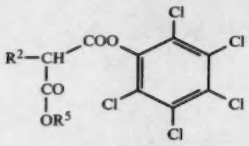
X is a group selected from the formulae consisting of:



by acylating a compound of the formula II



wherein R^4 is an easily removable ester-forming group selected from the group which consists of trialkylamino, trialkylsilyl, trichloroethyl, acetoxymethyl, phenacyl, phenyl and benzyl, or a salt formed with an alkali metal or a trialkylamine, in wich the acylation is performed at a temperature of −10° C. to +30° C. for a period up to 2 hours using an ester of the formula III



wherein

R^5 is aryl, alkyl, cycloalkyl or aralkyl, and

substituent R^4 and R^5 of the obtained product are split off.

4,171,304

2-IODOMETHYLPENAMS

Ronald G. Micetich, Edmonton, Canada, assignor to Conniab Holdings Limited, St. Laurent, Canada

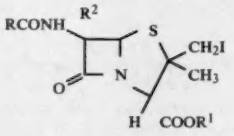
Division of Ser. No. 802,137, May 31, 1977, abandoned. This application Nov. 30, 1977, Ser. No. 855,978

Claims priority, application United Kingdom, Jun. 14, 1976, 24499/76

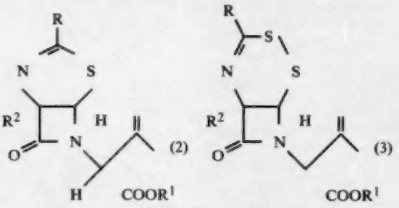
Int. Cl.[2] C07D *499/04*

U.S. Cl. 260—239.1 **7 Claims**

1. A process for preparing a 2-iodomethylpenam of the formula 1.



in which RCO is a conventional penicillin acyl moiety, R^1 is a conventional penicillin protecting group and R^2 is hydrogen or methoxy, which comprises treating an azetidinone derivative selected from those of formulae 2 and 3



in which R, R^1 and R^2 are as defined above, with iodine dissolved in a solvent, in the presence of a catalyst selected from the group consisting of air, oxygen and ferric chloride, and in the presence of moisture, at 0°–25° C., for a period of time of from five minutes to six hours, and isolating said 2-iodomethylpenam of formula 1.

4,171,305

BLOCKED ISOCYANATE

Kazutaka Mochizuki, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Japan

Filed Jan. 9, 1978, Ser. No. 868,061

Claims priority, application Japan, Jan. 14, 1977, 52-3200

Int. Cl.[2] C07D *223/10*

U.S. Cl. 260—239.3 R **5 Claims**

1. Substantially pure crystals of ϵ-caprolactam-diblocked ω,ω′-diisocyanato-1,3-dimethylbenzene, said crystals melting at 110° C. or higher.

4,171,306

DIEPOXY-ANDROSTANES AND A PROCESS FOR THE PREPARATION THEREOF

Zoltan Tuba, and Maria Marsai, both of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 702,051, Jul. 2, 1976, abandoned, Ser. No. 702,050, Jul. 2, 1976, abandoned, Ser. No. 709,323, Jul. 28, 1976, Pat. No. 4,071,515, Ser. No. 709,325, Jul. 28, 1976, Pat. No. 4,101,545, and Ser. No. 762,233, Jan. 25, 1977, Pat. No. 4,110,326. This application Jan. 25, 1977, Ser. No. 762,234

Claims priority, application Hungary, Jul. 15, 1975, R1 571

Int. Cl.[2] C07J *21/00*

U.S. Cl. 260—239.55 R 9 Claims

1. A compound selected from the group which consists of 5α, 17B-Diacetoxy-6B-chloro-2α, 3α; 16α, 17α-diepoxy-androstane; 5α, 17B-Diacetoxy-6B-chloro-androsta-2, 16-diene; and 5α-Hydroxy-6-B-chloro-17-oxo-androst-2-ene.

2. A process for the preparation of 5α, 17B-diacetoxy-6B-chloro-2α, 3α, 17α-diepoxy-androstane, which comprises reacting 5α, 6B-dihydroxy-17-oxo-androst-2-ene with an organic sulfonic acid chloride, reacting the obtained 5α-hydroxy-6B-chloro-17-oxo-androst-2-ene with isopropenyl acetate and treating the obtained 5α, 17B-diacetoxy-6B-chloro-androsta-2, 16-diene with an organic peracid to yield the corresponding diepoxide.

4,171,307

5-(4-BROMOPHENYL)OXAZOLE

Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,076

Int. Cl.[2] C07D *263/32*

U.S. Cl. 548—235 1 Claim

1. The compound 5-(4-Bromophenyl)oxazole.

4,171,308

WATER-SOLUBLE COATING COMPOSITION

Atsushi Kaiya, Kawasaki; Yutaka Otsuki, and Hideo Horii, both of Yokohama, all of Japan, assignors to Nippon Oil Co. Ltd., Tokyo, Japan

Division of Ser. No. 518,824, Oct. 29, 1974, abandoned. This application Oct. 25, 1977, Ser. No. 844,544

Claims priority, application Japan, Nov. 1, 1973, 48-123042

Int. Cl.[2] C08K *5/09*

U.S. Cl. 260—31.2 MR 12 Claims

1. A water-soluble coating composition comprising an adduct (1) of a butadiene lower polymer or lower copolymer (A) which has a number average molecular weight in a range of 200–10,000 and is liquid or semi-solid at room temperature and α,β-ethylenically unsaturated dicarboxylic acid compound (B) resulting from the reaction of said (A) and (B) at a temperature in the range of 120° to 250° C. in the presence of at least one N-nitrosamine derivative (C) in an amount of 0.005 to 5 percent by weight of said (A); a hydrophilic solvent (2) in an amount of less than 100 parts by weight to 100 parts by weight of said (A); and a neutralizer (3) in a range of 0.2 to 2.0 equivalents to said (A).

4,171,309

PROCESS FOR THE PREPARATION OF A SOLVENT-STABLE, RED-SHADE COPPER PHTHALOCYANINE PIGMENT COMPOSITION

Ian R. Wheeler, Craigend, Scotland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

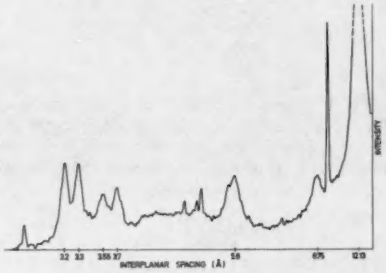
Filed Feb. 7, 1978, Ser. No. 875,844

Claims priority, application United Kingdom, Feb. 17, 1977, 6591/77

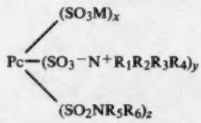
Int. Cl.[2] C09B *47/06, 67/00*

U.S. Cl. 260—314.5 6 Claims

1. In a process for the preparation of a solvent-stable, red-shade copper phthalocyanine pigment composition, wherein an organic compound capable of forming the phthalocyanine ring system, a copper compound capable of providing the copper atom of the copper phthalocyanine molecule, a reaction catalyst, and a nitrogen source are reacted at an elevated temperature and in an organic solvent wherein the improvement, whereby high quality pigments are obtained in a single



stage reaction without the need for acid pasting or mechanical pulverization, which consists of (a) substituting 2.5–10% by weight of the organic compound capable of forming the phthalocyanine ring system with benzophenone-3,3',4,4'-tetracarboxylic acid or a derivative thereof; and (b) adding 0–20% by weight of the total pigment composition of a compound of the formula



wherein Pc represents a metal - or a metal-free phthalocyanine residue, R_1, R_2, R_3, R_4, R_5 and R_6 are the same or different, and each represents a hydrogen atom, a cyclic or acyclic alkyl group, an aryl, aralkyl, alkaryl or dehydroabietyl group, M represents hydrogen, or an alkali metal atom, x, y and z are each in the range of from 0 to 4, with the proviso that the sum of x, y and z is within the range of from 1 to 4.

6. A solvent-stable, red-shade copper phthalocyanine composition when produced by the process claimed in claim 1.

4,171,310

N,N'-DICHLOROBICYCLO[2.2.2]OCT-7-ENE-2,3,5,6-TETRACARBOXYLIC-2,3,5,6-DIIMIDE

Ian G. Wright, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 19, 1977, Ser. No. 861,734

Int. Cl.[2] C07D *487/04, 501/10*

U.S. Cl. 260—326 C 1 Claim

1. N,N'-Dichlorobicyclo[2.2.2]-oct-7-ene-2,3,5,6-tetracarboxylic-2,3,5,6-diimide.

4,171,311

IMIDES OF THYROXIN AND TRIIODOTHYRONINE

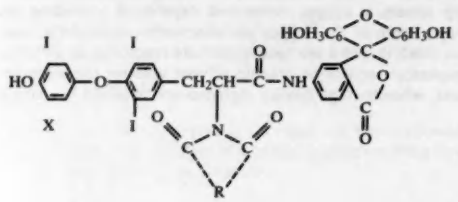
Constance J. Araps, San Jose, Calif., assignor to International Diagnostics Tech. Inc., Santa Clara, Calif.

Filed Jan. 16, 1978, Ser. No. 869,824

Int. Cl.[2] C07D *405/12*

U.S. Cl. 260—326.34 2 Claims

1. Compounds having the formula



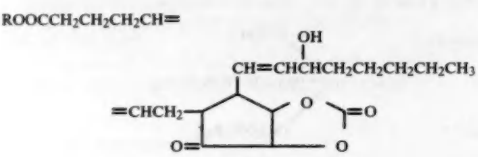
in which X is H or I and R represent the atoms completing an imide of a cyclic dicarboxylic acid selected from the group consisting of o-phthalic acid, naphthalic acid, cyclohexane dicarboxylic acid, succinic acid, maleic acid, and malic acid.

4,171,312
ALKYL 7-[TETRAHYDRO-4-(3-HYDROXY-1-OCTENYL)-2,6-DIOXO-4H-CYCLOPENTA-1,3-DIOXOL-5-YL]-5-HEPTENOATES

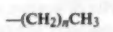
Karlene W. Salamon, Chicago, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed May 8, 1978, Ser. No. 903,470
Int. Cl.[2] C07D *317/44*
U.S. Cl. 260—340.2 **2 Claims**

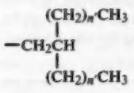
1. A compound of the formula



wherein R represents primary alkyl of the formula



or secondary alkyl of the formula



in which the numerical value of n, n′ and n″ is such that the total carbon content of each grouping represented by R is less than 8.

4,171,313
MOLYBDENUM AND TUNGSTEN PEROXO COMPLEXES USEFUL AS OXIDATION CATALYSTS

Frank Mares, Whippany; Stephen E. Jacobson, Randolph, and Reginald T. Tang, Bridgewater, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 14, 1977, Ser. No. 842,130
Int. Cl.[2] C07D *309/30, 313/04*; C07C *69/66, 59/04*
U.S. Cl. 260—343 **31 Claims**

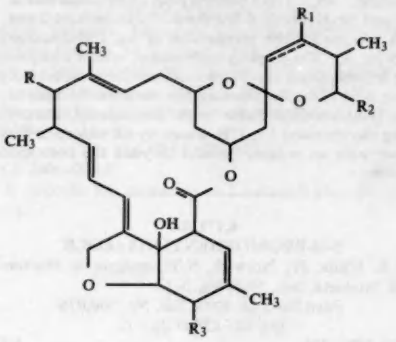
1. In a process for oxidation of alicyclic ketones to lactones, ω-hydroxy acids and esters wherein the oxidizing agent is hydrogen peroxide and the oxidation is catalyzed by a peroxo complex of molybdenum or tungsten, the improvement which comprises employing a peroxo complex soluble in the oxidation reaction mixture wherein molybdenum or tungsten atoms are connected to a complexing aza heterocyclic aromatic compound having carboxylic acid group on a carbon atom which is in α-position relative to the aza nitrogen.

4,171,314
13-HALO AND 13-DEOXY C-076 COMPOUNDS

John C. Chabala, Westfield; Michael H. Fisher, Bridgewater, and Helmut H. Mrozik, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 19, 1977, Ser. No. 861,810
Int. Cl.[2] C07D *493/22*
U.S. Cl. 260—343.41 **13 Claims**

1. A compound having the formula:



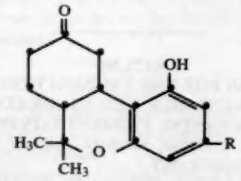
wherein the broken line indicates a single or a double bond;
R is halogen or hydrogen;
R_1 is hydroxy and is present only when said broken line indicates a single bond;
R_2 is n-propyl or sec-butyl; and
R_3 is methoxy or hydroxy.

4,171,315
PREPARATION OF CIS-HEXAHYDRODIBENZOPYRANONES

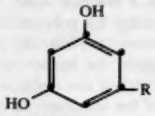
Charles W. Ryan, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 31, 1978, Ser. No. 892,350
Int. Cl.[2] C07D *311/78*
U.S. Cl. 260—345.3 **5 Claims**

1. A process for preparing a 6a,10a-cis-hexahydrodibenzopyranone of the formula



wherein:
R is C_5–C_{10} alkyl, C_5–C_{10} alkenyl, C_5–C_8 cycloalkyl or C_5–C_8 cycloalkenyl, comprising reacting 4-(1-hydroxy-1-methylethyl)-3-cyclohexen-1-one with a 5-substituted resorcinol of the formula



wherein R has the above-defined meaning, in the presence of a catalyst selected from boron tribromide, boron trifluoride and stannic chloride, in an unreactive organic solvent at a temperature from about −30° C. to about 100° C. for from about 0.5 to about 8 hours.

4,171,316

PREPARATION OF MALEIC ANHYDRIDE USING A CRYSTALLINE VANADIUM(IV)BIS(METAPHOSPHATE) CATALYST

S. Erik Pedersen, Havertown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 24, 1978, Ser. No. 889,785
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.75 **10 Claims**

1. A process for the preparation of maleic anhydride which comprises oxidizing an unsaturated aliphatic hydrocarbon selected from the group consisting of 1-butene, 2-butene and 1,3-butadiene or mixtures thereof in the vapor phase at temperatures in the range of about 300° C. to 600° C. and pressure of from about ambient pressures to 1000 psig with oxygen or an oxygen containing gas in the presence of a single phase crystalline vanadium(IV)bis(metaphosphate) catalyst having a surface area of from about 0.30 to 0.50 m^2/g.

4,171,317

SELECTIVE CONVERSION OF 20-METHYLPREGNA-3,5,20(21)-TRIENE-3,21-DIOL-DIACETATE TO 3-OXO-20-METHYLPREGNA-4,20(21)-DIENE-21-YL-ACETATE

LeRoy O. Krbechek, Golden Valley, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Mar. 27, 1978, Ser. No. 890,101
Int. Cl.[2] C07J *5/00*
U.S. Cl. 260—397.47 **20 Claims**

1. A process for the selective conversion of 20-methylpregna-3,5,20(21)-triene-3,21-diol-diacetate to 3-oxo-20-methylpregna-4,20(21)-diene-21-yl-acetate, including the steps of treating 20-methylpregna-3,5,20(21)-triene-3,21-dioldiacetate with a sufficient amount of a halogenated acid or mixtures thereof in the presence of a halogenated solvent or mixtures thereof until the formation of 3-oxo-20-methylpregna-4,20(21)-diene-21-yl-acetate from the 20-methylpregna-3,5,20(21)-triene-3,21-diol-diacetate is substantially complete.

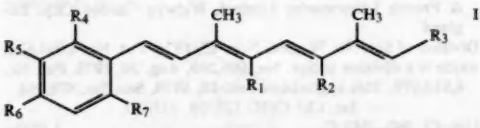
4,171,318

FLUORINATED POLYENES

Ka-Kong Chan, Hopatcong, and Beverly A. Pawson, Verona, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 24, 1978, Ser. No. 936,466
Int. Cl.[2] C09F *5/00*; C11C *3/00*; A01N *9/24*
U.S. Cl. 260—404 **20 Claims**

1. A compound having the formula:



I

wherein one of R_1 and R_2 is fluorine and the other is hydrogen;

R_3 is formyl, hydroxymethyl, alkoxymethyl, carboxyl, alkoxycarbonyl, carbamoyl, mono(lower alkyl)-carbamoyl or di(lower alkyl)carbamoyl; at least one of R_4, R_5 and R_7 is halogen and the others are hydrogen or lower alkyl; and R_6 is lower alkyl or lower alkoxy;

or pharmaceutically acceptable salts thereof.

4. The compound of claim 1 wherein the compound is ethyl (E,Z,E,E)-9-(6-chloro-4-methoxy-2,3-dimethylphenyl)-4-fluoro-3,7-dimethyl-2,4,6,8-nonatetraenoate.

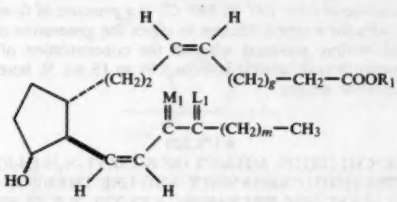
4,171,319

CIS-4,5-DIDEHYDRO-9-DEOXY-PGF COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 786,715, Apr. 11, 1977, abandoned, which is a division of Ser. No. 614,243, Sep. 17, 1975, Pat. No. 4,033,989. This application Jul. 12, 1978, Ser. No. 923,767
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—413 **7 Claims**

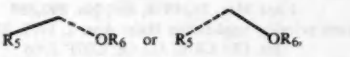
1. A prostaglandin analog of the formula



wherein

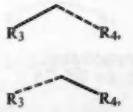
m is one to 5, inclusive:

wherein M_1 is

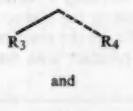


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

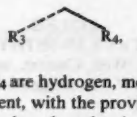
wherein L_1 is



or a mixture of and



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive. cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one

to 3 carbon atoms, inclusive or a pharmacologically acceptable cation; and
wherein g is one, 2, or 3.

4,171,320

HYDROCARBON SYNTHESIS FROM CO AND H_2 USING RU SUPPORTED ON GROUP VB METAL OXIDES

M. Albert Vannice, Boalsburg, Pa., and Samuel J. Tauster, Englishtown, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 19, 1977, Ser. No. 843,497
Int. Cl.[2] C07C *1/04*
U.S. Cl. 260—449 R **17 Claims**

1. A process for the synthesis of olefins of from C_2 to C_5 chain length inclusive, said process comprising the steps of passing H_2 and CO at a H_2/CO ratio of 0.1 to about 10 over a catalyst comprising ruthenium on a support selected from the group consisting of V_2O_3, Nb_2O_5, Ta_2O_5, Al_2O_3-V_2O_3, Al_2O_3-Nb_2O_5, Al_2O_3-Ta_2O_5, SiO_2-V_2O_3, SiO_2-Nb_2O_5, SiO_2-Ta_2O_5, V_2O_3-carbon, Nb_2O_5-carbon, Ta_2O_5-carbon, alkaline earth-group VB oxides, alkali-Group VB oxides, rare earth-Group VB oxides, Group IVB-Group VB oxides and mixtures thereof, at a space velocity of from 100 to 50,000 hr^{-1}, at a temperature of from 100° to 500° C., at a pressure of from 100 to 10^5 kPa for a time sufficient to effect the generation of the desired olefinic products wherein the concentration of said ruthenium in said catalyst is from 0.01 to 15 wt. % based on total catalyst weight.

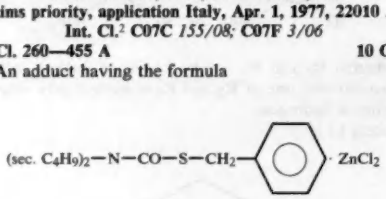
4,171,321

ZINC CHLORIDE ADDUCT OF BENZYL-N,N-DI-SEC. BUTYLTHIOLCARBAMATE AND USE THEREOF AS CATALYST FOR PREPARING BENZYL-N,N-DI-SEC. BUTYL-THIOLCARBAMATE FROM CARBAMOYL CHLORIDE AND BENZYL MERCAPTAN

Mario Bornengo; Sergio Bacciarelli, both of Massa, and Sergio Serdi, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Mar. 31, 1978, Ser. No. 892,399
Claims priority, application Italy, Apr. 1, 1977, 22010 A/77
Int. Cl.[2] C07C *155/08*; C07F *3/06*
U.S. Cl. 260—455 A **10 Claims**

1. An adduct having the formula



and the following characteristics:
viscosity: 1600 poises (at 20° C.)
density: 1.19 (at 20° C.).

7. The process for preparing benzyl-N,N-di-sec.butyl thiolcarbamate which comprises reacting N,N-di-sec.butyl carbamoyl chloride and benzyl mercaptan in the presence of an amount of the adduct of claim 1 corresponding to 0.03 gram atoms of zinc contained in the adduct for each mole of the reactants, at 65° C. and until the reaction is complete, and then washing the reaction product with water to decompose the catalyst.

4,171,322

HIGH SELECTIVITY CYANOETHYLATION PROCESS

Walter A. Butte, Jr., West Chester, and Wesley R. Cherry, Prospect Park, both of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Jun. 16, 1978, Ser. No. 916,394
Int. Cl.[2] C07C *120/00, 121/34*
U.S. Cl. 260—465.6 **7 Claims**

1. In a process for cyanoethylation of a polyhydric alcohol compound which comprises contacting said compound at cyanoethylation temperature with acrylonitrile and a cyanoethylation catalyst in a reaction zone, wherein the reaction tends to be accompanied by polymerization of acrylonitrile with resulting reduction in yield and purity of the desired cyanoethylation product, the improvement which comprises removing from the catalyst the reaction product, in which a total of 60 to 96% of the acrylonitrile required for complete cyanoethylation of said compound has been converted to cyanoethylated products and to other products, whereby the amount of products other than the desired cyanoethylation product is less than that obtained in the cyanoethylation of said compound in which the conversion of acrylonitrile exceeds 96%, and separating the desired cyanoethylation product in the reaction product from unreacted acrylonitrile.

4,171,323

SURFACE-ACTIVE AGENT

Pierre D. Marin, Rouen; Marcel Prillieux, and Robert Tirtiaux, both of Mont-Saint-Aignan, all of France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 648,120, Jan. 9, 1976, abandoned. This application Oct. 26, 1977, Ser. No. 845,565
Claims priority, application United Kingdom, Jan. 17, 1975, 2123/75
Int. Cl.[2] C07C *143/26*
U.S. Cl. 260—501.19 **10 Claims**

1. A salt, which is a surface active agent for oil in water emulsions and having improved sodium chloride brine compatibility, of an alkarylsulphonic acid the mean molecular weight of which is between 250 and 1000 and an organic base, said organic base being the addition product of one to 10 moles of ethylene oxide per mole of trialkanolamine having alkyl groups of less than six carbon atoms.

4,171,324

PREPARATION OF SODIUM ALLYL AND METHALLYL SULFONATE

Dieter J. Müller, and Wilhelm Knepper, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 813,011
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630238; May 6, 1977, 2720346
Int. Cl.[2] C07C *143/72*
U.S. Cl. 260—513 B **9 Claims**

1. In a process for the production of sodium allyl sulfonate and sodium methallyl sulfonate by the reaction of allyl chloride and methallyl chloride respectively, with aqueous Na_2SO_3, the improvement which comprises adding the allyl or methallyl chloride in a 10–40% stoichiometric excess and with vigorous mixing to an aqueous Na_2SO_3 solution, at a temperature of 33°–70° C.; in the case of allyl chloride, and 33°–80° C., in the case of methallyl chloride, and conducting the reaction at a pressure of 1.0–2.3 bar while maintaining the pH of the reaction mixture at 7–11 by the addition of sodium hydroxide, until consumption of Na_2SO_3 is substantially complete.

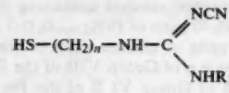
4,171,325

CHEMICAL PROCESS

Thomas H. Brown; Graham J. Durant, both of Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 741,586, Nov. 15, 1976, Pat. No. 4,093,621, which is a division of Ser. No. 606,269, Aug. 20, 1975, Pat. No. 4,013,678. This application Feb. 16, 1978, Ser. No. 878,194
Int. Cl.[2] C07C *125/08, 133/10*
U.S. Cl. 260—551 C **1 Claim**

1. A compound of the formula:



wherein n is 2 and R_1 is methyl.

4,171,326

PROCESS FOR PREPARING 2-(1-CYCLOHEXENYL)-CYCLOHEXANONE

Joseph F. M. Klein, Bunde; Petrus A. M. J. Stijfs, Munstergeleen, and Jozef A. Thoma, Sittard, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 649,575, Jan. 16, 1976, Pat. No. 4,052,458. This application Jun. 27, 1977, Ser. No. 810,374

Claims priority, application Netherlands, Jan. 17, 1975, 7500549

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.[2] **C07C** *45/00*

U.S. Cl. 260—586 C **9 Claims**

1. In a process for preparing 2-(1-cyclohexenyl)cyclohexanone including condensing cyclohexanone in the presence of a strong acid ion exchange catalyst and removing the water formed by distillation of the resulting reaction mixture, the improvement comprising conducting the condensation with a macro-porous ion exchange resin at atmospheric pressure and a temperature of about 50° to 125° C., the macro-porous ion exchange resin comprising a sulfonated copolymer of styrene having 15 to 20% by weight of divinyl benzene therein, and pores having an average pore size in excess of 100 Å in diameter, or an internal surface area greater than 30 square meters per gram, or both, contacting the cyclohexanone with the macro-porous ion exchange resin at a space velocity from 1 to 659 grams of cyclohexanone per gram of resin per hour, continuing the condensation such that the conversion of the cyclohexanone is maintained at 50% or less, separating the ion exchange resin from the reaction mixture and distilling the reaction mixture to remove the water formed in the absence of the ion exchange resin and recovering the 2-(1-cyclohexenyl)-cyclohexanone product.

4,171,327

2-DECARBOXY-2-ALKYLCARBONYL-PGF COMPOUNDS

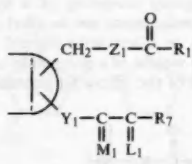
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 888,695, Mar. 21, 1978, Pat. No. 4,123,463. This application Jul. 17, 1978, Ser. No. 925,507

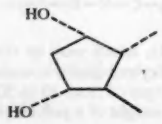
Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 260—586 R **55 Claims**

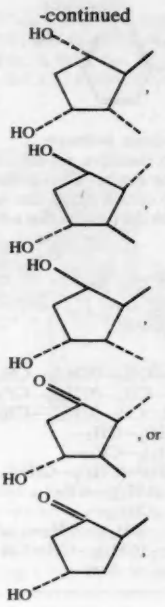
1. A prostaglandin analog of the formula



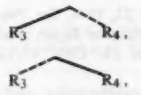
wherein D is



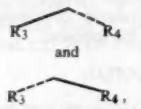
-continued



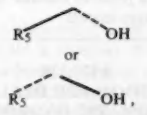
wherein R_1 is alkyl of one to 4 carbon atoms, inclusive:
wherein L_1 is



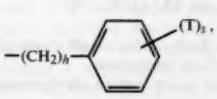
or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is

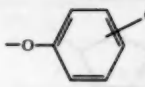


wherein R_5 is hydrogen or methyl;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,



(2)

-continued



(3)

wherein h is zero to three, inclusive;
wherein m is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —CH_2CH_2—, or
(4) —C≡C—; and
wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—,
(8) —$(CH_2)_3$—O—$(CH_2)_g$—,
(9) —C≡C—CH_2—$(CH_2)_g$—CH_2—, or
(10) trans—$(CH_2)_2$—$(CH_2)_g$—CH=CH—,
wherein g is one, two, or three.

4,171,328

CATALYTIC OXIDATION OF ISOBUTYLENE

Sumio Umemura; Kyoji Ohdan; Kenichi Suzuki, and Terumi Hisayuki, all of Ube, Japan, assignors to Ube Industries Ltd., Yamaguchi, Japan

Filed Jun. 22, 1978, Ser. No. 917,793
Claims priority, application Japan, Nov. 7, 1977, 52-132440
Int. Cl.[2] C07C *45/02*
U.S. Cl. 260—604 R **11 Claims**

1. In a process for catalytically oxidizing isobutylene at a temperature in the range of from 250° to 500° in the vapor phase with molecular oxygen to form methacrolein, the improvement which comprises passing a gaseous feed comprising isobutylene and molecular oxygen in a catalytic oxidation reaction zone over a catalyst consisting essentially of metal oxides represented by the formula:

$$Mo_aBi_bFe_cCo_dZr_eX_fTi_gO_h$$

wherein Mo is molybdenum, Bi is bismuth, Fe is iron, Co is cobalt, Zr is zirconium, X is at least one metal selected from the group consisting of calcium and zinc, Ti is titanium and O is oxygen, and each of the subscripts a through g is a positive number indicating an atomic ratio of the respective metal to bismuth and falling within the following ranges: a=5 to 20, b=1, c=0.2 to 5, d=1 to 10, e=0.01 to 2, f=0.01 to 2 and g=0.01 to 1, and h is a positive number satisfying the average valency of the respective metals.

4,171,329

NOVEL METHOD FOR DEALKYLATING ALKYLAROMATIC HYDROCARBONS

Leon F. Koniz, Poughkeepsie, and John H. Estes, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 704,003, Jul. 9, 1976, abandoned. This application Mar. 16, 1978, Ser. No. 887,392
Int. Cl.[2] C07C *3/62*
U.S. Cl. 585—487 **9 Claims**

1. The process for dealkylating an alkylaromatic hydrocarbon charge stream which comprises:
passing a mixture of steam and an alkylaromatic hydrocarbon, at stam dealkylating conditions, into contat with an activated supported catalyst containing 0.5–40 parts of $(VIII)_{2/n}O$, –0–40 parts of $(VI)_{2/nm}O$, 0–5 parts of $(I)_2O$, and 15–99.5 parts of alumina support whereinVIII is a metal of valence n of Group VIII of the Periodic Table, VI is a metal of Group VI B of the Periodic Table of valence m, and I is a metal of Group I A of the Periodic Table, said alumina support having been prepared by:
(i) adding to a calcined charge high-purity alumina an activating amount of at least one alkaline earth metal together with a catalytically acceptable anion;
(ii) maintaining said charge alumina in contact with said activating amount of said alkaline earth metal whereby said alkaline earth metal is distributed throughout at least a portion of the body of said charge alumina, thereby forming desired product treated alumina containing an activating amount of at least one alkaline earth metal together with at least one catalytically acceptable anion; and
(iii) recovering said desired product treated alumina containing an activating amount of alkaline earth metal together with at least one catalytically accetable anion.

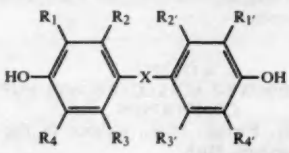
4,171,330

FIRE-RETARDANT RESIN COMPOSITION

Kayomon Kyo, Kyoto; Katsuhiro Hirose, Uji; Kenji Yasue, Uji; Sinichi Tokumitsu, Uji, and Haruo Kohyama, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Jan. 20, 1978, Ser. No. 871,168
Int. Cl.[2] C08L *77/00*
U.S. Cl. 525—180 **27 Claims**

1. A fire-retardant resin composition comprising
(A) 1 to 98.9% by weight of an aromatic copolyester comprising the reaction product in about equimolar amounts of
(1) a mixture of terephthalic acid and isophthalic acid or the functional derivatives thereof with the terephthalic acid unit to th isophthalic acid unit molar ratio being about 9:1 to about 1:9 and
(2) a bisphenol of the general formula [I]



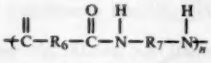
[I]

wherein —X— represents a member selected from the group consisting of 13 O;13 , —S—, —SO_2—,—SO—, —CO—, an alkylene group containing 1 to 5 carbon atoms and alkylidene group containing 1 to 5 carbon atoms, and $R_1RLhd\ 2R_3R_4R_1'$, R_2', R_3' and R_4', which may be the same or different, each is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom and an alkyl group containing 1 to 5 carbon atoms, or a derivative thereof.
(B) 1 to 98.9% by weight of a polyamide containing therein a repeating unit of the following general formula [II]:

[II]

or

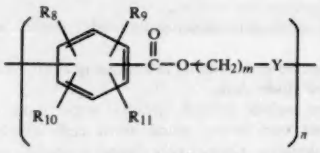
[III]



[III]

wherein R_5R_6 and R_7, which may be the same or different, each represents an alkylene group containing 4 to 11 carbon atoms and n is an integer of from 30 to 500, and
(C) 0.1 to 98% by weight of a polyalkylene phenylene ester

or a polyalkylene phenylene ester ether containing therein a repeating unit of the following general formula [IV];



[IV]

wherein R_8R_9, R_{10} and R_{11}, which may be the same of different, each is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom and an alkyl group containing 1 to 5 carbon atoms, m is an integer from 1 to 10 and n is an integer from 30 to 500, and Y is an ester unit or an ether unit; and

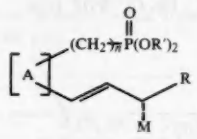
(D) 0.5 to 50% by weight, based on the total amount of components (A), (B), (C) and (D), of an aromatic halogen compound.

4,171,331
1 AND 2-SUBSTITUTED ANALOGUES OF CERTAIN PROSTAGLANDINS

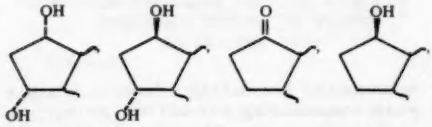
William G. Biddlecom; Harold C. Kluender, and Warren D. Woessner, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

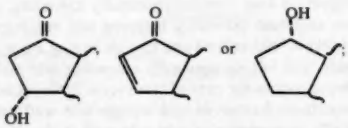
Filed Jun. 5, 1978, Ser. No. 912,515
Int. Cl.[2] A01N 9/36; C07F 9/40
U.S. Cl. 260—946 **8 Claims**

1. Trans, 1&2-di(loweralkyl)phosphono analogues of E_1, A_1, $F_{1\alpha}$, $F_{1\beta}$, 11-deoxy-E_1, 11-deoxy-$F_{1\alpha}$, and 11-deoxy $F_{1\beta}$ prostaglandins represented by the structural formula:



wherein n is 6 or 7, M is H or OH; A is





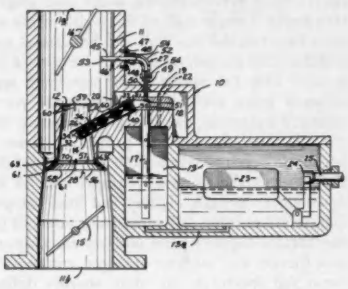
R′ is methyl, ethyl, propyl or butyl; and R is $(CH_2)_3CH_3$, $(CH_2)_4CH_3$, CH_3, cyclohexyl,

$(CH_2)_2CH_3$ or $(CH_2)CH_3$.

4,171,332
FUEL-AIR MIXER FOR CARBURETORS

Walther Gohnert, P.O. Box 62, Black Diamond, Wash. 98010

Filed Dec. 8, 1977, Ser. No. 858,552
Int. Cl.[2] F02M 29/04
U.S. Cl. 261—78 R **16 Claims**



1. In a carburetor having an air induction tube, a venturi in the induction tube and a fuel supply tube leading from a first open end within the venturi to a second open end remote from the venturi and in communication with a fuel supply system, a fuel-air mixing improvement comprising:

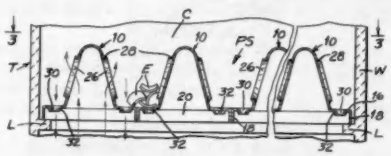
a wire screen having a width dimension substantially equal to the inside cross-sectional diameter of the fuel supply tube and wherein the screen is received longitudinally within the fuel supply tube to progressively break droplets of fuel into smaller droplets as they are drawn into the airstream passing through the venturi, and to cause turbulence of the droplets as they move through the fuel supply tube; and

baffle means within the inducton tube adjacent the venturi for directing flow of air through the venturi.

4,171,333
TOWER PACKING SUPPORT

Frank D. Moore, Tallmadge, Ohio, assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 797,489, May 16, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,391
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—94 **2 Claims**



1. A support plate supporting a relatively heavy bed of packing elements within a chamber of predetermined cross sectional area in a gas-liquid treatment tower adapted to support the support plate comprising a plurality of adjacent sections each spanning a portion of the cross sectional area of the chamber and supported at opposite ends, each section supporting a portion of the heavy bed of packing elements having a top wall portion above an internal chamber situated between spaced relatively thin sidewall portions, including apertures providing a relatively large amount of open area through which gas passes from the internal chamber into the bed of packing elements, extending downwardly from the top wall portion to relatively thin horizontal wall portions, including openings providing a relatively large amount of open area through which a counter flowing liquid passes downwardly

from the heavy bed of packing elements which would normally impose a load sufficient to bend conventional relatively thin perforated sidewall portions, wherein the improvement comprises:

primary flanges, including inner peripheral surface extending around and between enlarged entrances and more sharply defined exits of longitudinally spaced elongated apertures of predetermined width and length extending lengthwise a major part of the width of the sidewall portions between the top wall and horizontal wall portions, and the inner peripheral surfaces are curved to a radius of at least 25% the width of the adjoining aperture from adjacent inner surfaces of the sidewall portions at the enlarged entrances, said flanges extending the length of the apertures therein and projecting from the sidwall portions a depth of at least 20% the width of the apertures, and wherein the sidewall portions have at least two (2) times more strength, rigidity and load carrying capacity than relatively thin self supporting sidewall portions of a comparable support plate with an equal amount of open area therein and without enlarged entrances and flanges about the apertures, the more sharply defined exits increase the resistance to entrance of the fluid from the exits and simultaneous flow of the counter flowing liquid and gas through the same elongated apertures and the enlarged entrances are of sufficient size and shape and area to reduce the resistance to gas flow whereby the support plate in use has at least 5% less pressure drop at the same gas flow rate and can handle at least 5% greater volume of gas at the same pressure drop than the comparable support plate.

4,171,334

APPARATUS FOR SECURING ASSEMBLY PLATES IN SPRAYING INSTALLATIONS OF HEAT EXCHANGERS

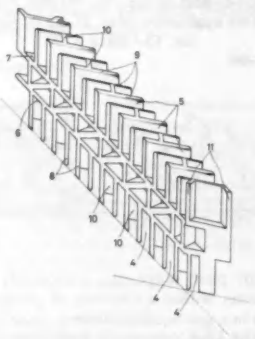
Paul Reiter, Hattingen, Fed. Rep. of Germany, assignor to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,661

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712702

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—112 **12 Claims**



1. An apparatus for securing of assembly plates in spraying installations of heat exchangers, particularly cooling towers, with at least two layers of vertical assembly plates, which layers are disposed one above the other, the assembly plates in each layer respectively being arranged parallel to each other, and from layer to layer are arranged at a predetermined spacing as well as at a predetermined angle with respect to one another, comprising

a spacer defining a longitudinal extent and adapted to be arranged diagonally relative to the angularly crossing assembly plates, said spacer including portions forming a plurality of lower guide slots and a plurality of upper guide slots, respectively,

said upper guide slots running mutually parallel to each other,

said lower guide slots running mutually parallel to each other,

said upper guide slots running at a crossing angle relative to said lower guide slots,

said portions include contact surfaces, respectively, of said upper and said lower guide slots, respectively, said contact surfaces, respectively being spaced from each other corresponding to the predetermined spacing of the assembly plates of the two layers which are disposed one above the other.

4,171,335

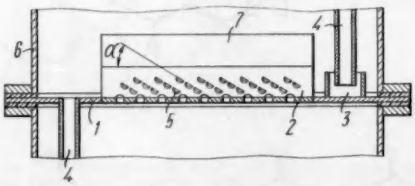
CONTACT PLATE FOR MASS-EXCHANGE COLUMNS

Alexandr N. Planovsky, ulitsa Kropotkina, 8, kv. 11, Moscow; Vladimir P. Pavlov, ulitsa Shmidta, 18, kv. 34, Schelkovo Moskovskoi oblasti; Valery E. Trubkin, Gruzinsky val, 18/15, kv. 77, Moscow; Evgeny V. Fedotov, Serpukhovsky val, 22, korpus 3, kv. 102, Moscow; Jury V. Tetivkin, Slavyansky bulvar, 47, kv. 103, Moscow; Oleg L. Ershov, ulitsa Ostrovityanova, 45, kv. 275, Moscow; Alexei A. Volchenko, Varshavskoe shosse, 10, kv. 169, Moscow; Gaioz A. Pagava, ulitsa Mayakovskogo, 20, kv. 5; Zurab Y. Kervalishvili, prospekt Lenina, 14, kv. 6, both of Rustavi; Vladislav V. Smyslov, Proletarsky prospekt, 64, korpus 4, kv. 102, Moscow, and Vadim F. Belugin, ulitsa Lenina, 37, kv. 56, Fryazino Moskovskoi oblasti, all of U.S.S.R.

Filed Oct. 26, 1977, Ser. No. 845,731

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—155 **12 Claims**

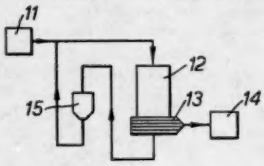


1. A contact plate for mass-exchange columns comprising: a base; a pocket communicating with said base for receiving liquid; a pocket communicating with said base for discharging liquid; at least one longitudinally extending trough provided on said base extending between said receiving and discharge pockets, said at least one trough having a continuously curved side wall having upwardly extending side wall portions defining a concavely curved transverse cross-section, a plurality of apertures formed in said trough side wall extending substantially tangentially to said side wall in the transverse direction toward one of said side wall portions for the passage of gas therethrough toward said one of said upwardly extending side wall portions; and a guide apron provided on said one of said upwardly extending side wall portions comprising a substantially continuous extension thereof and having an upper terminal edge; whereby gas directed through said apertures form whirls in a transverse cross-section of the trough, said gas flow travelling over said one of said side wall portions to said guide apron and upwardly over said terminal edge portion thereof.

4,171,336
BALLING PROCESS

Neil Munro, High Leigh nr. Knutsford; Peter E. Wellstead, Hyde; George A. Carter, Stokesley, and Mark Cross, Marton-in-Cleveland, all of England, assignors to British Steel Corporation, Great Britain

Continuation of Ser. No. 691,785, Jun. 1, 1976, abandoned. This application Feb. 9, 1978, Ser. No. 876,496
Int. Cl.[2] B01J *2/12*
U.S. Cl. 264—37 11 Claims

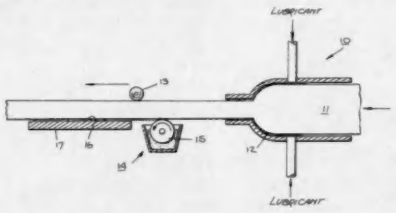


1. In a continuous process for balling particulate material comprising the steps of:
(a) improving the adhesion properties of said particulate material;
(b) balling said particulate material of step (a) in a balling device to produce green balls;
(c) discharging said balls from said balling device;
(d) separating balls having a size other than a predetermined size from balls having said predetermined size in the discharge of said balling device; and,
(e) returning material, which is discharged from said balling device in the form of balls having sizes other than said predetermined size, to said balling device for balling with added particulate material; the improvement comprising:
reducing surging in said balling process by modifying the fundamental direct relationship between discharged undersized balls and those recharged to the balling operation to reduce system gain.

4,171,337
PROCESS FOR FORMING CERAMIC BODIES EMPLOYING AQUEOUS LUBRICANT

Meyer R. Rosen, Spring Valley, N.Y.; David B. Braun, Ridgefield, Conn., and Stephen Drap, Pawling, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,979
Int. Cl.[2] B28B *3/20*
U.S. Cl. 264—56 15 Claims

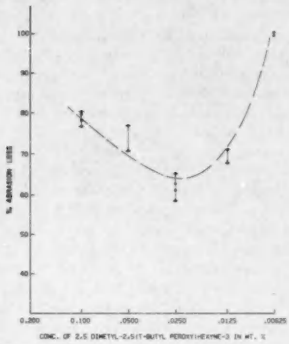


1. In a process for forming a shaped green ceramic body including conforming a wet clay composition to one or more metallic surfaces, and providing a lubricant at the interface between said wet clay composition and said metallic surfaces during said conforming, the improvement comprising using as said lubricant an aqueous solution of a high molecular weight, water-soluble polymer.

4,171,338
PROCESS FOR ULTRA-HIGH MOLECULAR WEIGHT, HIGH ABRASION RESISTANCE, CROSS-LINKED POLYETHYLENE

Charles D. Mason, Chatham Township, Morris County, N.J., assignor to Allied Chemical Corporation, Morris County, Township, N.J.

Filed Nov. 1, 1977, Ser. No. 847,644
Int. Cl.[2] D01F *1/02*
U.S. Cl. 264—211 6 Claims



1. In a method for preparing abrasion resistance polyethylene compositions which comprises:
(a) homogeneously mixing an organic peroxide with an ultra-high molecular weight polyethylene powder, said polyethylene powder having a viscosity average molecular weight of at least about 1,000,000 and a density of between about 0.92 and 0.99 as determined by ASTM Method D 792;
(b) introducing the homogeneous mixture into a melt shaping apparatus; and
(c) melt shaping and simultaneously cross-linking the polyethylene, the improvement which comprises introducing, as the organic peroxide, about 0.01 to 0.1 weight percent based on the total weight of the composition, of an organic peroxide having a half life from about 15 seconds to 3 minutes at 190° C.

4,171,339
PROCESS FOR PREPARING A POLYCRYSTALLINE DIAMOND BODY/SILICON CARBIDE SUBSTRATE COMPOSITE

Minyoung Lee, Schenectady; Lawrence E. Szala, Scotia, and Robert C. De Vries, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 844,447, Oct. 21, 1977. This application Apr. 17, 1978, Ser. No. 889,108
Int. Cl.[2] C04B *35/56, 35/58;* B24D *3/06*
U.S. Cl. 264—332 7 Claims

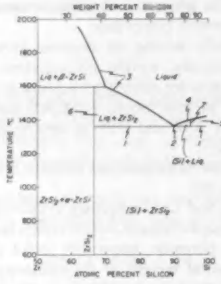
1. A process for preparing an integral composite of a polycrystalline diamond body and silicon carbide substrate at pressures substantially below those required by the diamond stable region which includes a hot-pressing step and which comprises:
(a) placing within a protective container or cup a mass of solid eutectiferous silicon-rich alloy, or solid components for providing eutectiferous silicon-rich alloy, a mass of diamond crystals and a silicon carbide substrate, said mass of diamond crystals being intermediate and in contact with said substrate and said mass of solid eutectiferous silicon-rich alloy, or with at least one of said components for providing eutectiferous silicon-rich alloy, said eutectiferous silicon-rich alloy being composed of silicon and a metal which forms a silicide with said silicon and which is selected from the group consisting of cobalt, chromium,

iron, hafnium, manganese, molybdenum, nickel, palladium, platinum, rhenium, rhodium, ruthenium, tantalum, thorium, titanium, uranium, vanadium, tungsten, yttrium, zirconium, and alloys thereof, said substrate consisting essentially of a hot-pressed or sintered polycrystalline silicon carbide body;

(b) disposing said container and its contents within a pressure transmitting powder medium that transmits applied pressure substantially undiminished and remains substantially unsintered during said hot-pressing;

(c) applying sufficient substantially isostatic pressure to said container and its contents via said powder medium to substantially stabilize the dimensions of said container and said contents substantially uniformly producing a shaped substantially isostatic system of powder-enveloped container wherein the density of the resulting compressed mass of diamond crystals is higher than 70% by volume of the volume of said compressed diamond crystals;

(d) hot pressing the resulting substantially isostatic system producing fluid infiltrating eutectiferous silicon-rich alloy and infiltrating said fluid eutectiferous silicon-rich alloy through the interstices of said compressed mass of diamond crystals and into contact with the contacting surface of said substrate which forms an interface with said compressed mass of crystals, said hot-pressing being carried out at an hot-pressing temperature below 1600° C. under a hot-pressing pressure sufficient to infiltrate said fluid silicon-rich alloy throughout the interstices of said



compressed mass of diamond crystals, said solid eutectiferous silicon-rich alloy, or solid components for providing eutectiferous silicon-rich alloy being used in an amount sufficient to produce sufficient fluid eutectiferous silicon-rich alloy at said hot-pressing temperature to fill the interstices of said compressed mass of diamond crystals and contact the contacting surface of said substrate filling the pores through the interface so that it is at least substantially pore-free, said hot-pressing being carried out in an atmosphere which has no significant deleterious effect on said diamond crystals or said infiltrating fluid silicon-rich alloy or on said silicon carbide substrate, said hot-pressingconverting less than 5% by volume of said diamond crystals to non-diamond elemental carbon, said infiltrating silicon-rich alloy encapsulating the surfaces of the compressed diamond crystals reacting with the diamond surfaces or non-diamond elemental carbon producing a carbide which at least in major amount is silicon carbide;

(e) maintaining sufficient pressure on the resulting hot-pressed substantially isostatic system during cooling thereof to at least substantially maintain the dimensions of said hot-pressed system; and

(f) recovering the resulting composite of polycrystalline diamond body bonded to silicon carbide substrate wherein the diamond crystals are present in an amount from at least 70% by volume up to but less than 90% by volume of said polycrystalline diamond body, said diamond body being at least substantially pore-free and being free of elemental non-diamond carbon phase in that it does not contain non-diamond elemental carbon phase in an amount detectable by X-ray diffraction analysis.

4,171,340

FUMIGATING APPARATUS AND METHOD

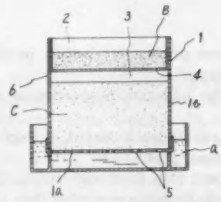
Akira Nishimura; Takanobu Kashihara; Fukuyasu Okuda, and Masanaga Yamaguchi, all of Ako, Japan, assignors to Earth Chemical Company, Ltd., Hyogo, Japan

Filed Mar. 2, 1978, Ser. No. 882,816

Claims priority, application Japan, Mar. 3, 1977, 52-23475[U]; Mar. 18, 1977, 52-33445[U]; Mar. 18, 1977, 52-33446[U]; Apr. 27, 1977, 52-54648[U]; May 13, 1977, 52-61975[U]; Jun. 6, 1977, 52-74167[U]; Jul. 23, 1977, 52-98584[U]

Int. Cl.[2] **A61L** *1/00, 3/00;* **A01M** *13/00*

U.S. Cl. 422—36 **29 Claims**



1. A fumigating apparatus comprising a container having at least one compartment accommodating a mixture of an active ingredient and a blowing agent which is decomposable at a temperature of between about 70° C. and about 300° C. to give off mainly nitrogen gas and at least one further compartment provided adjacent to said compartment and accommodating an exothermic substance which evolves heat by contact with water, the interior of the container being divided with a partition into said compartments, the partition providing a surface for transferring the heat evolved from said exothermic substance to the mixture, the compartment accommodating the exothermic substance being provided with water supplying means.

23. A fumigating method comprising heating indirectly a mixture of an active ingredient and a blowing agent with heat evolved from an exothermic substance which evolves heat by contact with water, thereby decomposing the blowing agent and volatilizing the active ingredient, said blowing agent being decomposable at a temperature of between about 70° C. and about 300° C. to give off mainly nitrogen gas and contacting an object, material or area to be treated with the so generated fumigant.

4,171,341

SOLID STATE SENSOR

Michael J. Morgan, Syracuse, N.Y., assignor to Inficon Leybold-Heraeus Inc., East Syracuse, N.Y.

Filed Oct. 12, 1977, Ser. No. 841,285

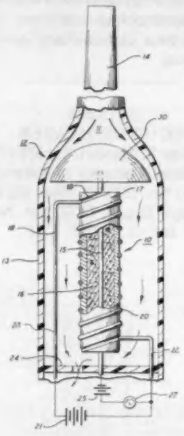
Int. Cl.[2] **G01N** *31/04*

U.S. Cl. 422—98 **12 Claims**

1. Apparatus for detecting the presence of a given gas or vapor contained within an atmosphere including

a hollow self-standing shield formed of a material which is deplete of alkali metal ions whereby said shield is capable of acting as a depletion boundary in relation to the ions of said alkali metal,

an elongated electrode positioned within the shield generally along the central axis thereof,



a reactive compound of an alkali metal that is capable of reacting with the given gas or vapor completely filling the area between the shield and the electrode, and

a heating coil wound about the outer surface of the shield.

4,171,342

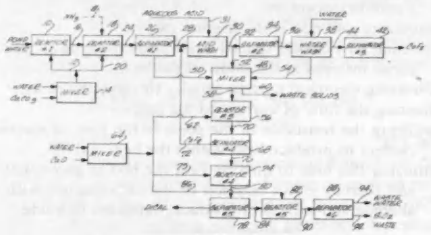
RECOVERY OF CALCIUM FLUORIDE FROM PHOSPHATE OPERATION WASTE WATER

Ronald J. Hirko, and Harold E. Mills, both of Lake City, Fla., assignors to Occidental Chemical Company, Houston, Tex.

Continuation-in-part of Ser. No. 840,533, Oct. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 756,009, Jan. 3, 1977, abandoned, which is a continuation of Ser. No. 457,565, Apr. 3, 1974, abandoned. This application Dec. 22, 1977, Ser. No. 863,085

Int. Cl.[2] C01F *11/22*

U.S. Cl. 423—160 **36 Claims**



1. The method of recovering calcium fluoride from pond waters comprising from about 0.1 to about 5.0% fluorine, from about 0.1 to about 5.0% P_2O_5, from about 0.1 to about 2.5% SiO_2, from about 0.1 to about 0.5 dissolved calcium, from about 0.1 to about 0.5% soluble sulfate salts, and soluble metallic compounds such as iron, aluminum, and magnesium comprising the steps of:

(a) adding with agitation to the pond water calcium carbonate in sufficient amounts so that between about 0.3 to about 0.8 equivalent of calcium is added per equivalent of fluorine whereby soluble calcium salts are formed;

(b) adding, with agitation to the calcium carbonate treated pond water of step (a), additional amounts of calcium carbonate corresponding to about 0.1 to about 2.0 equivalents of calcium per equivalent of fluorine so that the total calcium equivalent added in steps (a) and (b) is from about one to about two; whereby solids are formed comprising calcium fluoride, calcium phosphate, and silicon, iron, aluminum and magnesium;

(c) separating the solids from the pond water, said solids containing at least 85% of the initial fluorine present in the pond water as calcium fluoride; and

(d) purifying the calcium fluoride in the solids recovered in step (c).

17. A method of recovering calcium fluoride from pond water comprising from about 0.1 to about 5.0% fluorine values and from about 0.1 to about 5.0% P_2O_5 values comprising the steps of:

(a) adding with agitation to the pond water a calcium containing compound selected form the group consisting of calcium carbonate, calcium oxide, and combinations thereof in sufficient amounts such that between about 0.3 to about 0.8 equivalent of calcium is added per equivalent of the fluorine values whereby soluble calcium salts are formed;

(b) adding, with agitation to the treated pond water from step (a), additional calcium containing compound selected from the group consisting of calcium carbonate, calcium oxide, and combinations thereof corresponding to about 0.1 to about 2.0 equivalents of calcium per equivalent of the fluorine values present in the pond water to form solids containing calcium fluoride and calcium phosphate values, such that the total equivalent of calcium added in steps (a) and (b) is no less than about 0.8 equivalent per equivalent of fluorine values in the pond water, provided that when the total equivalent of calcium added in steps (a) and (b) is about 0.8, the amount added in step (a) is less than the total amount added in step (a) and step (b);

(c) separating solids from the pond water, said solids containing the major part of the initial fluorine values in the pond water as calcium fluoride; and

(d) purifying calcium fluoride in the solids recovered in step (c).

4,171,343

STARTUP PROCEDURE FOR THE SYNTHESIS OF AMMONIA

Paul J. Faust, Dickinson, and Otto C. Pless, Jr., Alta Loma, both of Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 7, 1978, Ser. No. 931,847

Int. Cl.[2] C01C *1/04*

U.S. Cl. 423—359 **10 Claims**

1. An improved startup procedure for the synthesis of ammonia in which preheated feed streams of desulfurized hydrocarbon gas, steam and air routed through an ammonia train having the following equipment, a primary reformer, a secondary reformer, a high temperature CO shifter, a low temperature CO shifter, a CO_2 removal system, a methanator and a synthesis converter system for the purpose of producing ammonia, wherein the improvement comprises the following steps:

(a) preheating said primary and secondary reformers with steam and simultaneously preheating said low temperature CO shifter with preheated desulfurized hydrocarbon gas;

(b) injecting and preheated feed streams of desulfurized hydrocarbon gas and steam into said primary and secondary reformers along with injecting air into said secondary reformer to produce reformed gas, using said reformed gas to preheat said high temperature CO shifter to provide converted gas, and simultaneously venting said desulfurized hydrocarbon gas from said low temperature CO shifter to said CO_2 removal system to preheat said system;

(c) routing a portion of said converted gas from said high temperature CO shifter to said CO_2 removal system to aid in preheating said system;

(d) routing said preheated feed streams of desulfurized hydrocarbon gas, steam and air from said primary and secondary reformers through said high temperature CO

shifter, through said low temperature CO shifter and through said CO_2 removal system into said methanator to preheat said vessel; and

(e) routing said preheated feed streams from step (d) to said synthesis converter system having a converter vessel to preheat said vessel for the production of ammonia.

4,171,344

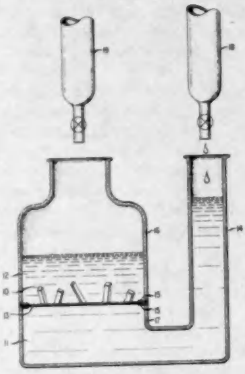
CRYSTAL GROWTH FROM SOLUTION

Howard J. Guggenheim, Somerville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 26, 1974, Ser. No. 483,303

Int. Cl.[2] C01C *3/00*

U.S. Cl. 423—364 **1 Claim**



1. Method for the production of a crystalline body of a material comprising continually introducing first liquid from a reservoir of first liquid into a body of second liquid by slow permeation of first liquid through a porous partition separating the reservoir of first liquid from the body of second liquid, producing supersaturation of the material in the second liquid only in the vicinity of the partition and the crystalline body, and causing the first liquid to permeate through the partition by maintenance of a hydrostatic pressure differential across the partition, producing the crystalline body in contact with the partition, wherein the material is produced by a chemical reaction between at least one constituent of the first liquid and at least one constituent of the second liquid, wherein the material is $K_2[Pt(CN)_4].Br_{0.3}.3H_2O$, the first liquid is an aqueous solution of $K_2[Pt(CN)_4]$ and the second liquid is an aqueous solution of $K_2[Pt(CN)_4]Br_2$.

4,171,345

METHOD OF MANUFACTURE OF REINFORCING CARBON BLACK

Vassil S. Toshev; Yordan G. Patov, and Emilia I. Angelova, all of Sofia, Bulgaria, assignors to Vish Chimiko-Technologicheski Institute, Sofia, Bulgaria

Filed Jul. 26, 1977, Ser. No. 819,146

Int. Cl.[2] C07C *3/00, 5/00, 11/02*

U.S. Cl. 423—450 **3 Claims**

1. A method for the production of carbon black which comprises the steps of

(a) pyrolyzing at a temperature range of from 250° C. to 950° C., a composition consisting of 0 to 100% scrap vulcanized rubber, 0 to 70% particulate and yarn polymeric resin wastes, and 0 to 50% coke-production, petroleum-refining and petrochemical-derived hydrocarbons to form a mixture of volatile products;

(b) heating said volatile products to a temperature in the range 400° C. to 900° C.;

(c) thereafter recovering and condensing from said products a fraction of cyclic hydrocarbons having a correlation index in excess of 90 and mean boiling temperature not higher than 390° C. and a boiling range of 200° C. to 500° C.; and

(d) injecting said cyclic hydrocarbon fraction as a substantial portion of the feedstock in admixture with other carbon black feedstock to a carbon-black generating burner to form carbon black.

4,171,346

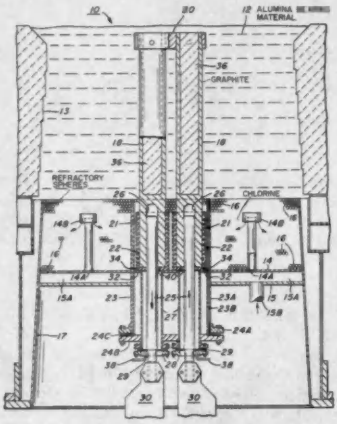
REACTOR HEATER

Larry K. King, and Roy E. Hardwick, both of Maryville, Tenn., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 752,788, Dec. 20, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,201

Int. Cl.[2] C01F *7/56*

U.S. Cl. 423—496 **2 Claims**



2. A method for producing aluminum chloride from a reaction of chlorine with alumina and carbon, the method comprising the steps of

providing a reaction chamber and a reaction bed of alumina-bearing particles in said chamber, the particles containing a carbon component,

fluidizing said bed with chlorine gas,

locating two closely spaced apart posts made of a carbonaceous material in the midst of the bed,

directing electrical current serially through the posts,

limiting the flow of current to the posts,

utilizing the resistance of the posts to the flow of electrical current to produce heat within the bed, and

utilizing this heat to directly heat the bed to above 400° C. and thereby effect reaction of the chlorine gas with the alumina and carbon to produce aluminum chloride.

4,171,347

CATALYTIC INCINERATION OF HYDROGEN SULFIDE FROM GAS STREAMS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

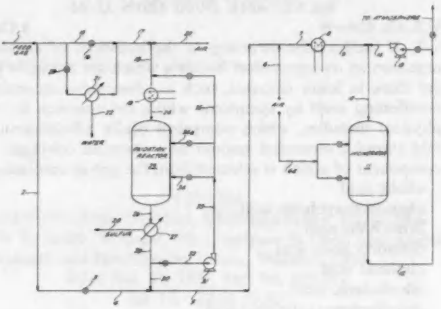
Continuation-in-part of Ser. No. 738,134, Nov. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 605,638, Aug. 18, 1975, Pat. No. 4,092,404. This application Apr. 15, 1977, Ser. No. 787,905

Int. Cl.[2] C01B *17/50*; B01D *53/34*

U.S. Cl. 423—539 **19 Claims**

1. A process for oxidizing H_2S to SO_2 in a feed gas containing a minor proportion of H_2S and a substantial proportion of at least one secondary oxidizable component selected from the class consisting of H_2, CO, and light hydrocarbons, which process comprises:

(1) contacting said feed gas, in admixture with sufficient oxygen to convert at least about 80% of said H_2S to SO_2, with an oxidation catalyst at a temperature between about 300° and 900° F. and at a space velocity correlated with temperature so as to convert at least about 80% of said H_2S to SO_2 without oxidizing substantially any of said



secondary oxidizable components, said oxidation catalyst comprising a vanadium oxide and/or sulfide as the essential active component supported on a non-alkaline porous refractory oxide; and

(2) recovering a gaseous effluent of reduced H_2S content, but still containing essentially all of said secondary oxidizable component or components.

4,171,348

PROCESS FOR ELIMINATING CARBON DEPOSITION ON SULFUR DIOXIDE REDUCTION CATALYST IN A STAGED REACTOR SYSTEM

Cicero A. Bernales, Liverpool, N.Y., and Aubrey W. Michener, Morristown, N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Jun. 29, 1978, Ser. No. 920,749
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—570 **15 Claims**

1. A process for preventing carbonaceous deposits on catalytic surfaces during the catalytic reduction of gaseous sulfur dioxide to elemental sulfur at temperatures from about 700° to 2400° F. with a hydrocarbon reducing agent which normally would form said carbonaceous deposits on the catalyst surface under the reaction conditions employed wherein said reduction reaction is effected at an initiation temperature from about 700° to 1550° F. comprising the steps of:

(a) preheating separately the SO_2 gas stream to a temperature of about 50° to 500° F. above said initiation temperature, preheating separately a first portion of the reductant to a temperature of about 100° to 800° F. below said initiation temperature,

(b) mixing the two preheated streams just prior to their entry into a reaction zone; and

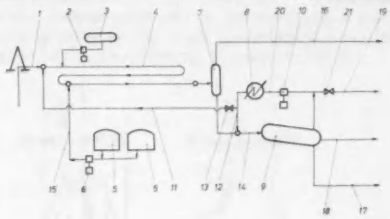
(c) passing the resulting mixture into said reaction zone under reaction conditions including a temperature sufficient to initiate reaction of the reductant with the SO_2 feed to produce a product gas stream containing elemental sulfur product.

4,171,349

DESULFURIZATION PROCESS AND INSTALLATION FOR HYDROCARBON RESERVOIR FLUIDS PRODUCED BY WELLS

Iulius M. Cuculat, and Vasile V. Popp, both of Cimpina, Romania, assignors to Institutul de Cercetari Si Proiectari Pentru Petrol Si Gaze, Cimpina, Romania

Filed Apr. 14, 1978, Ser. No. 896,394
Claims priority, application Romania, Aug. 12, 1977, 91347
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—574 L **6 Claims**



1. A method of removing hydrogen sulfide from a three-phase mixture of crude oil, natural gas, and water as said mixture issues as a stream from an oil well, said method comprising the steps of:

(a) adding sulfur dioxide to said stream without substantially changing the temperature or pressure of said stream and thereafter rendering said stream turbulent to intimately contact said sulfur dioxide with the hydrogen sulfide in said stream, thereby reacting same together and leaving only trace hydrogen sulfide in said stream;

(b) adding water to said stream from step (a) said water containing (1) cations capable of forming insoluble sulphides or (2) an alkaline for neutralizing said trace hydrogen sulfide;

(c) separating the desulfurized natural gas from said stream from step (b);

(d) adding hot and sulfur-free crude oil to the remaining stream from step (c) to heat same to about 120° C. to melt elemental sulfur therein;

(e) gravitationally separating the sulfur and water from said stream from step (d), leaving substantially pure sulfur-free crude oil in said stream; and

(f) heating a portion of the pure crude oil of step (e) and adding said hot crude oil in step (d).

4,171,350

METHOD FOR REACTING HYDROGEN AND OXYGEN IN THE PRESENCE OF A LIQUID PHASE

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 265,975, Jun. 26, 1972, abandoned. This application Aug. 3, 1978, Ser. No. 930,707
Int. Cl.[2] C01B *5/00*
U.S. Cl. 423—580 **3 Claims**

1. The method for promoting the reaction between hydrogen gas and oxygen gas in the presence of liquid water to produce a water reaction product consisting essentially of the steps of:

(a) providing a fixed bed of platinized particles, said platinized particles having been partially encapsulated with 0.1%–100% of polytetrafluoroethylene by weight,

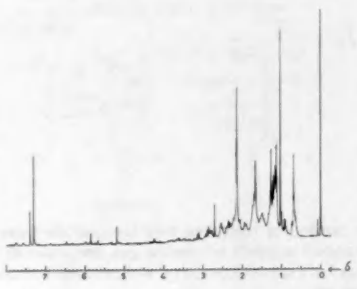
(b) bringing said hydrogen gas into contact with said liquid water and said platinized particles, and

(c) bringing said oxygen gas into contact with said liquid water and said hydrogen gas and said platinized particles to effect reduction oxidation between said hydrogen and oxygen at said platinized paticles and in the presence of said liquid water to produce the water reaction product.

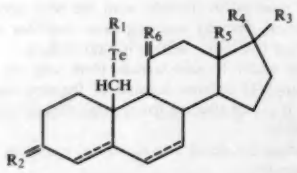
4,171,351
TELLURYL COMPOUNDS, THEIR PREPARATION AND USE

Augustinus P. M. van der Veek, Voorschoten, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands

Filed May 23, 1977, Ser. No. 799,526
Claims priority, application Netherlands, May 28, 1976, 7605739
Int. Cl.[2] A61K *43/00*; C07J *7/00, 9/00*
U.S. Cl. 424—1 18 Claims



1. Telluryl derivatives of the formula



in which one of the dotted lines represents a double bond, Te is selected from the group consisting of a radioactively labelled tellurium isotope and a non-labelled tellurium atom,

R_1 is ethyl containing in the β-position 2 to 3 alkyls of 1 to 2 carbon atoms each,

R_2 is selected from the group consisting of a double-bonded oxygen atom and a hydrogen atom plus an OR_7 group, in which

R_7 is selected from the group consisting of a hydrogen atom, an alkanoyl group and an organic group that is easily removed from the oxygen atom,

R_3 is selected from the group consisting of a hydrogen atom, a hydroxyl group and 1,5-dimethyl hexyl, optionally containing a member selected from the group consisting of methyl, and ethyl in the 4-position,

R_4 is selected from the group consisting of a hydrogen atom, an acetyl group and a hydroxyacetal group or R_3 and R_4 are together an oxygen atom,

R_5 is selected from the group consisting of a methyl and a formyl group, and

R_6 is selected from the group consisting of a double-bonded oxygen atom, a hydrogen atom plus a hydroxyl group and two hydrogen atoms.

17. A diagnostic preparation to be used for diagnostic investigation into abnormalities of internal organs comprising a liquid or solid carrier for the acceptable body and an effective amount of a radioactively labelled telluryl derivative of claim 1.

18. A method for the diagnostic determination of steroids in bodily fluids, wherein use is made of a telluryl derivative of claim 1.

4,171,352
QUANTITATIVE EVALUATION OF ENTERIC MICROBIAL OVERGROWTH

Richard L. Wolgemuth, Hatfield, Pa.; Kenneth M. Hanson, and Peter H. Zassenhaus, both of Columbus, Ohio, assignors to Polysciences, Inc., Warrington, Pa.

Filed Aug. 22, 1977, Ser. No. 826,539
Int. Cl.[2] A61K *29/00*; G01N *33/16*
U.S. Cl. 424—9 4 Claims

1. A method for detecting in the intestines of an animal organism an overgrowth of bacteria which are normally present there in lesser amounts, such an abnormal concentration manifesting itself by symptoms which are common to other physical maladies, which comprises orally administering to said animal a measured amount of a chemical conjugate one component of which is selected from the group consisting of:

cholic acid
chenodesoxycholic acid
lithocholic acid
dehydrocholic acid
cholanic acid
allocholanic acid
dehydrodesoxycholanic acid
desoxybilianic acid
isodesoxybilianic acid
bilianic acid
etiocholanic acid
12-ketocholanic acid
hyodesoxycholic acid
norcholanic acid
ursocholanic acid
hyobeoxycholic acid
5-β-cholanic acid-3α,6α-diolacetate
5-β-cholanic acid-3α,12α-diol difurmate
5-β-cholanic acid-7α,12α-diol
5-β-cholanic acid-3α,7α-diol-12-one
7-ketodeoxy cholic acid
7,12-diketocholanic acid
3,12-diketocholanic acid, and
3,7-diketocholanic acid

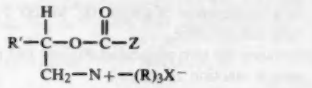
and the other component of which is para-amino benzoic acid which is absorbed from the intestines and excreted in the urine without substantial metabolic alteration, said conjugate being one which is cleaved into said components by the enzymes produced by said intestinal bacteria, collecting urine from said animal at a time interval after such administration and assaying it for said amino acid content, a content higher than an established average content found in urine from like healthy animals under the same method conditions being taken as indicative of an overgrowth of intestinal bacteria.

4,171,353
IMMUNIZATION OF ANIMALS USING CHOLINE ESTERS AS AN IMMUNOLOGICAL ADJUVANT

Wayne L. Ryan, 3631 S. 116th Ave., Omaha, Nebr. 68144

Filed May 16, 1978, Ser. No. 906,626
Int. Cl.[2] A61K *39/00, 39/02, 39/12*
U.S. Cl. 424—88 29 Claims

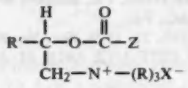
1. In the immunization of animals with antigens, the improvement which comprises administering to said animals with said antigen an effective amount of a choline ester as an immunological adjuvant, said choline ester having the structure:



wherein R is lower alkyl, R′ is selected from H or R, Z is selected from NH_2 or R and X is halo.

21. An immunological composition comprising effective amounts of an antigen capable of inducing immunization in

animals when administered thereto and as an immunological adjuvant, a choline ester having the structure:



wherein R is lower alkyl, R′ is selected from H or R, Z is selected from NH_2 or R and X is halo.

4,171,354

VACCINE FOR ANIMAL RESPIRATORY DISEASES

Clyde K. Smith, Wooster, Ohio, assignor to Ohio Agricultural Research and Development Center, Wooster, Ohio

Filed Jun. 23, 1977, Ser. No. 809,292
Int. Cl.[2] A61K *39/02*
U.S. Cl. 424—92 **10 Claims**

1. A method of immunizing cattle against respiratory disease of the type exhibiting the presence of Pasteurella sp. comprising administering, by intradermal injection prior to a stressing period, an immunologically effective amount of a vaccine containing a live culture of a *Pasteurella hemolytica* bacteria.

6. An improved vaccine for stimulating antibody response in cattle to respiratory diseases of the type exhibiting the presence of Pasteurella sp. said antibody response being evoked by the intradermal injection thereof into said cattle prior to the occurence of a stressing period, said vaccine consisting essentially of:

brain-heart infusion broth present as an aqueous dispersion of proteinaceous material;

an antibody-free fetal calf serum admixed with said broth and initially present in said broth in an amount representing about 2% by volume; and

a field strain live culture of *Pasteurella hemolytica* incubated within said serum containing broth over an interval selected to drive a bacterial population effective to stimulate an immune response within said cattle following the said intradermal injection thereof.

4,171,355

CERTAIN TICKICIDAL PYRETHROID MIXTURES AND STABILIZER THEREFOR

Vincent K. Stubbs, Caboolture, Australia; Francis S. Downing, Macclesfield, and Gordon J. Marrs, Windsor, both of England, assignors to ICI Australia Limited, Melbourne, Australia

Filed Oct. 4, 1977, Ser. No. 839,201
Claims priority, application Australia, Oct. 5, 1976, 7614/76
Int. Cl.[2] A01N *9/02*
U.S. Cl. 424—174 **5 Claims**

1. A process for killing Boophilus microplus ticks which process comprises treating media infested with said ticks with a tickicidally effective mixture comprising as a first component, 3-phenoxybenzyl(±)-cis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate; as a second component, 0,0-diethyl 0-(2-diethylamino-6-methylpyrimidin-4-yl) phosphorothioate, and as a third component, 2-hydroxy-4-n-octoxybenzophenone, the weight ratio of the said first component to the said second component being in a range from 5:1 to 1:5, and the weight ratio of the said first component to the said third component being in a range from 100:1 to 2:1.

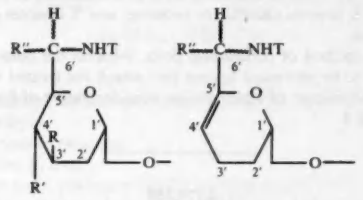
4,171,356

2-UNSUBSTITUTED DERIVATIVES OF 4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOIS, METHODS FOR THEIR USE AS ANTIBACTERIAL AGENTS AND COMPOSITIONS USEFUL THEREFOR

John J. Wright, Cedar Grove, and Alan K. Mallams, West Orange, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Oct. 28, 1976, Ser. No. 736,640
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—180 **14 Claims**

1. A 2′-unsubstituted derivative of a 4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol antibacterial agent, wherein the 4-O-aminoglycosyl moiety in said 2′-unsubstituted derivative is defined by one of the following Formulae I and II:



I II

wherein R and R′ are each members selected from the group consisting of hydrogen and hydroxy; R″ is a member selected from the group consisting of hydrogen and methyl; T is a member selected from the group consisting of hydrogen, alkyl, hydroxyalkyl and aminoalkyl said alkyl having up to 4 carbon atoms;

and when the 1,3-diaminocyclitol has a 5-hydroxyl group in the equatorial position, the 5-epi, 5-deoxy, 5-epi-azido-5-deoxy, 5-epi-amino-5-deoxy derivatives thereof,

the 1N-X-derivatives of the foregoing, wherein X is a substituent selected from the group consisting of $—CH_2—Y$ and

wherein Y is a member selected from the group consisting of hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkylalkyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, aminohydroxyalkyl, alkylaminohydroxyalkyl, phenyl, benzyl and tolyl, said Y having up to 8 carbon atoms and when substituted by both amino and hydroxy groups, said groups are on different carbon atoms;

and the pharmaceutically acceptable acid addition salts thereof.

13. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection which comprises administering to said animal a non-toxic, antibacterially effective amount of a compound of claim 1.

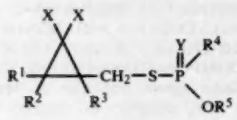
4,171,357

CYCLOPROPYLMETHYLPHOSPHORIC ACID DERIVATIVES

Hans Theobald; Heinrich Adolphi, both of Limburgerhof, and Karl Eicken, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 805,414, Jun. 10, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 890,578
Claims priority, application Fed. Rep. of Germany, Jun. 31, 1976, 2634587
Int. Cl.[2] A01N *9/36;* **C07F** *9/177*
U.S. Cl. 424—224 **5 Claims**

1. Phosphoric acid derivatives of the formula



I,

where R^1, R^2 and R^3 are identical or different and each denotes hydrogen or linear or branched alkyl of a maximum of 6 carbon atoms, R^4 denotes linear or branched alkoxy, alkylthio, alkenylthio or alkynylthio of a maximum of 6 carbon atoms, linear or branched alkyl of a maximum of 3 carbon atoms, phenyl, benzylthio, amino, or linear or branched alkylamino or dialkylamino with a maximum of 5 carbon atoms in the alkyl, R^5 denotes linear or branched alkyl of a maximum of 6 carbon atoms, X denotes chlorine or bromine, and Y denotes oxygen or sulfur.

2. A method of combatting pests, wherein the pests or the objects to be protected against pest attack are treated with an effective amount of a phosphoric acid derivative of formula I of claim 1.

4,171,358

NOVEL CONTRACEPTIVE METHOD

Larry J. Black, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 462,458, Apr. 19, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 677,951

Int. Cl.[2] **A61K** *31/56*

U.S. Cl. 424—243 **5 Claims**

1. A contraceptive method comprising the daily administration of a progestin to a female mammal during the follicular phase of the menstrual cycle at a dose insufficient to suppress ovulation in a majority of female mammals and then administering no hormone during the luteal phase of the menstrual cycle.

4,171,359

BENZ-TETRASUBSTITUTED 1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

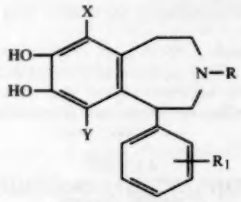
Joseph Weinstock, Phoenixville, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Apr. 12, 1978, Ser. No. 895,700

Int. Cl.[2] **A61K** *31/55;* **C07D** *223/16*

U.S. Cl. 424—244 **16 Claims**

1. A compound of the formula:



in which:

X and Y are each halo or lower alkyl of 1–4 carbons;

R is hydrogen, methyl, ethyl, allyl, dimethylallyl, thenyl or furylmethyl; and

R_1 is hydrogen, methyl, methoxy, hydroxy, acetoxy, halo, trifluoromethyl or methylthio; together with pharmaceutically acceptable nontoxic salts thereof or O-aklkanoyl esters thereof having from 2–7 carbons in each alkanoyl group.

4,171,360

PHOSPHINEGOLD (I) SALTS HAVING ANTIARTHRITIC ACTIVITY

David T. Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 21, 1978, Ser. No. 879,319

Int. Cl.[2] **C07F** *1/12;* **A61K** *33/24, 31/44*

U.S. Cl. 424—245 **4 Claims**

1. A compound of the formula:

in which:

R_1 being alkyl, lower alkoxy or phenyl, said phenyl being optionally monosubstituted by halogen or lower alkoxy;

R_2 and R_3 are lower alkyl or lower alkoxy and

X is a weakly nucleophilic anion selected from perchlorate, iodate, tetrafluoroborate or hexafluorophosphate.

2. A pharmaceutical composition having antiarthritic activity, in dosage unit form, comprising a pharmaceutical carrier and a compound of claim 1.

4,171,361

1-SUBSTITUTED-3-AMINO-6,7-DIALKOXY-1H-1,2,4-BENZOTHIADIAZINE-1-OXIDES

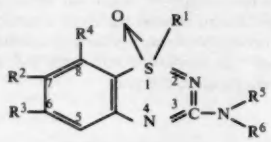
Robert D. Dillard, Zionsville, and Donald E. Pavey, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 31, 1977, Ser. No. 783,125

Int. Cl.[2] **A61K** *31/54, 31/55;* **C07D** *417/04, 419/14*

U.S. Cl. 424—246 **13 Claims**

1. A compound of the formula:



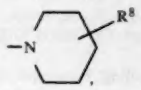
wherein R^1 is C_1–C_3 alkyl,

R^7 is hydrogen, chloro, bromo, fluoro, methyl, ethyl, methoxy, ethoxy or trifluoromethyl;

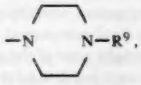
R^2 and R^3 when taken singly are methoxy or ethoxy and when taken together are methylene dioxy,

R^4 is H or methoxy, Ser. No. 783,125

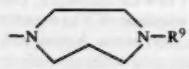
R^5 and R^6, when taken together with the nitrogen to which they are attached form a piperidino group



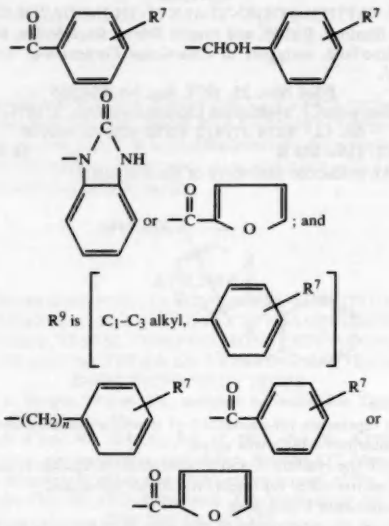
a piperazino group



a homopiperzino group



or a 4-hydroxy-4-phenylpiperidino group wherein R^8 is a substituent in the 3 or 4 position of the piperidine ring chosen from the group consisting of OH, lower alkanoyloxy, lower alkoxy, hydroxy lower alkyl,



wherein n is 0, 1 or 2, and pharmaceutically-acceptable acid addition salts thereof.

13. The method of reducing blood pressure in a mammal with elevated blood pressure and in need of treatment which comprises administering a hypotensive dose of a compound according to claim **1** sufficient to lower said elevated blood pressure in said hypertensive mammal.

4,171,362

7-ACYLAMINO-3-(SULFAMINOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL)CEPHALOSPORINS ANTIBACTERIAL COMPOSITIONS CONTAINING THEM AND METHODS OF TREATING BACTERIAL INFECTIONS WITH THEM

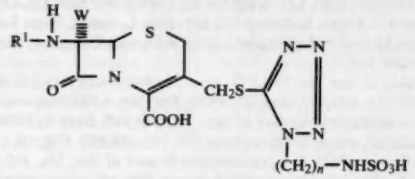
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 704,142, Jul. 12, 1976, Pat. No. 4,118,491, which is a continuation-in-part of Ser. No. 665,837, Mar. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,164, Oct. 30, 1975, abandoned. This application Jul. 14, 1978, Ser. No. 924,471

Int. Cl.[2] **A61K** *31/545*; **C07D** *501/50, 501/56*

U.S. Cl. 424—246 **17 Claims**

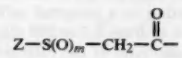
1. A compound of the formula:



in which:

W is hydrogen or methoxy;

R^1 is an acyl group of the formula:



where

Z is methyl, trifluoromethyl, trifluoroethyl, cyanomethyl or pyridyl;

m is zero to two; and

n is two to five,

or a non-toxic pharmaceutically acceptable salt thereof.

10. An antibacterial pharmaceutical composition comprising a compound as claimed in claim **1** and a pharmaceutically acceptable carrier therefor.

12. A method of treating bacterial infections comprising administering internally by injection to an infected or susceptible warm-blooded animal an antibacterially effective but non-toxic dose of a compound as claimed in claim **1**.

4,171,363

1,2,3-THIADIAZOLE PROCESS

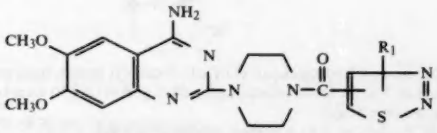
Ronnie R. Crenshaw, Dewitt, and Richard A. Partyka, Liverpool, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 770,966, Feb. 22, 1977, Pat. No. 4,101,548. This application May 17, 1978, Ser. No. 906,888

Int. Cl.[2] **A61K** *31/505*

U.S. Cl. 424—251 **3 Claims**

1. A process for treating hypertension which comprises systemically administering to a mammal in need of said treatment an antihypertensive effective amount of a compound having the formula



or a pharmaceutically acceptable salt thereof wherein

R_1 is hydrogen, amino, lower alkyl of 1 to 4 carbon atoms inclusive, or $NHCO_2R_2$ in which R_2 is lower alkyl of 1 to 4 carbon atoms inclusive.

4,171,364
N-HETEROCYCLIC UREAS AS IMMUNE REGULANTS

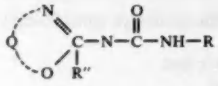
Charles J. Paget, Indianapolis, and John L. Sands, West Lafayette, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 843,775, Oct. 20, 1977, which is a division of Ser. No. 651,322, Jan. 21, 1976, Pat. No. 4,088,768, which is a continuation-in-part of Ser. No. 574,997, May 6, 1975, abandoned, which is a division of Ser. No. 398,607, Sep. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 185,823, Oct. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 794,756, Jan. 28, 1969, abandoned. This application Nov. 30, 1978, Ser. No. 965,358

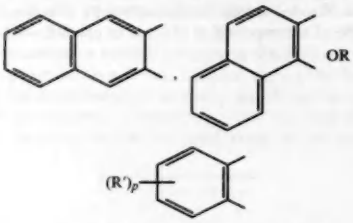
Int. Cl.[2] A61K *31/42*

U.S. Cl. 424—272 **1 Claim**

1. The method for regulating the immune response which comprises administering to a mammal suffering from an immune reaction a dose of from 0.1 to 500 mg/kg of mammalian body weight of a compound of the formula:



wherein R is α-naphthyl, phenyl or substituted phenyl or substituted phenyl wherein said substituents can be one or two members of the group consisting of halo, C_1–C_3 alkoxy, C_1–C_3 alkyl or CF_3, R″ is H or CH_3 and Q is



wherein R′ in each of its "p" occurrences independently represents halo, CF_3, carb-C_1–C_3-alkoxy, nitro, C_1–C_3 alkyl or C_1–C_3 alkoxy and p is 0–2.

4,171,365
ANTIVIRAL ARYLOXYALKYLPYRAZOLES

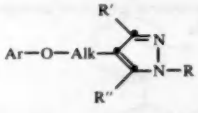
Guy D. Diana, Stephentown, and Philip M. Carabateas, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,246

Int. Cl.[2] A61K *31/415*; C07D *231/22, 231/12*

U.S. Cl. 424—273 P **33 Claims**

1. A compound of the formula



wherein R is hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, carboalkoxyalkyl of 3 to 6 carbon atoms, or phenyl;

R′ is alkyl of 1 to 4 carbon atoms or phenyl;

R″ is alkyl of 1 to 4 carbon atoms, phenyl or hydroxy;

Alk is alkylene of 3 to 10 carbon atoms optionally interrupted by an oxygen atom separated by at least two carbon atoms from the terminal bonds of Alk;

and Ar is phenyl or phenyl substituted by from 1 to 3 substituents selected from the group consisting of halo, hydroxy, nitro, alkyl of 1 to 4 carbon atoms, lower-alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, hydroxyalkyl of 2 to 4 carbon atoms, benzyloxy and trifluoromethyl;

or a pharmaceutically acceptable acid-addition salt thereof.

32. A method for combatting viruses which comprises contacting the locus of said viruses with an antivirally effective amount of at least one compound according to claim 1.

4,171,366
1-NAPHTHOTHIENYLALKYL-1H-IMIDAZOLES

Hans Blattner, Riehen, and Angelo Storni, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

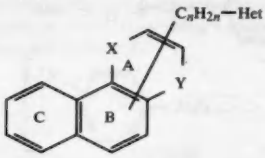
Filed Nov. 25, 1977, Ser. No. 854,935

Claims priority, application Luxembourg, Dec. 1, 1976, 76303

Int. Cl.[2] A61K *31/415*; C07D *409/10, 409/06*

U.S. Cl. 424—273 R **16 Claims**

1. An imidazole derivative of the formula I



(I)

wherein

Het represents 1H-imidazol-1-yl which is unsubstituted or is substituted by lower alkyl,

one of the symbols X and Y represents the epithio radical -S- and the other represents the direct bond, and

n represents 1 to 4, and

besides the substitution of ring A or B by the radical-C_nH_{2n}-Het, ring A is unsubstituted or is monosubstituted by chlorine or methyl, ring B is unsubstituted or is monosubstituted by chlorine, methyl or methoxy, and ring C is unsubstituted or is monosubstituted by halogen up to atomic number 35, trifluoromethyl, lower alkyl, lower alkoxy or lower alkylthio; and the pharmaceutically acceptable monoacid acid addition salts thereof.

16. A method for the treatment of mental depression in a warm-blooded animal comprising enteral or parenteral administration to said animal of a therapeutically effective amount of a compound according to claim 1 having the formula I defined in claim 1, or of a pharmaceutically acceptable monoacid acid addition salt thereof.

4,171,367
PYRAZOLYL AMINO IMIDAZOLINES

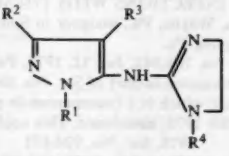
Martin Winn, Deerfield, and Carl W. Nordeen, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 770,137

Int. Cl.[2] A61K *31/415*; C07D *403/12*

U.S. Cl. 424—273 P **12 Claims**

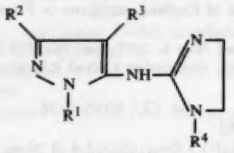
1. A compound represented by the structural formula



wherein R^1 and R^2 are each hydrogen, C_1–C_6 alkyl, cycloalkyl up to 6 carbon atoms or phenyl, R^3 is hydrogen or halogen, R^4

is hydrogen or acetyl, and pharmaceutically acceptable acid addition salts thereof.

11. A method of treating inflammation in mammalian patients in need of such treatment which comprises administering to said patients an effective amount of a compound represented by the structural formula



wherein R^1 and R^2 are each hydrogen, C_1–C_6 alkyl, cycloalkyl up to 6 carbon atoms or phenyl, R^3 is hydrogen or halogen, R^4 is hydrogen or acetyl or a pharmaceutically acceptable acid addition salt thereof, either alone or in admixture with a pharmaceutically acceptable carrier.

4,171,368
7-ACYLAMINO-3-(SULFAMINOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL)CEPHALOSPORINS, ANTIBACTERIAL COMPOSITIONS CONTAINING THEM AND METHODS OF TREATING BACTERIAL INFECTIONS WITH THEM

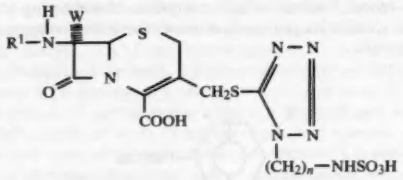
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 704,142, Jul. 12, 1976, Pat. No. 4,118,491, which is a continuation-in-part of Ser. No. 665,837, Mar. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,164, Oct. 30, 1975, abandoned. This application Jul. 14, 1978, Ser. No. 924,522

Int. Cl.[2] **A61K** *31/545;* **C07D** *501/50, 501/52, 501/56*

U.S. Cl. 424—246 **21 Claims**

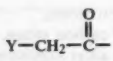
1. A compound of the formula:



in which:

W is hydrogen or methoxy,

R^1 is an acyl group of the formula:



where:

Y is thienyl, tetrazolyl, sydnone, cyano or aminomethylphenyl; and

n is two to five,

or a non-toxic pharmaceutically acceptable salt thereof.

10. An antibacterial pharmaceutical composition comprising a compound as claimed in claim **1** and a pharmaceutically acceptable carrier therefor.

12. A method of treating bacterial infections comprising administering internally by injection to an infected or susceptible warm-blooded animal as antibacterially effective but non-toxic dose of a compound as claimed in claim **1**.

4,171,369
HYDRO-4-PHENYL-BENZ[*f*]ISIONDOLINE COMPOUNDS

Roland Achini, Therwil; Wolfgang Oppolzer, Genéve, and Emil Pfenninger, Therwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

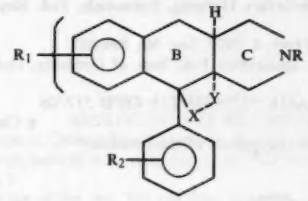
Continuation-in-part of Ser. No. 546,054, Jan. 31, 1975, abandoned, which is a continuation-in-part of Ser. No. 400,434, Sep. 24, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 558,931

Claims priority, application Switzerland, Sep. 29, 1972, 14250/72; Aug. 3, 1973, 11305/73

Int. Cl.[2] **A61K** *31/40;* **C07D** *209/44*

U.S. Cl. 424—274 **106 Claims**

1. A compound of formula



wherein

R is (i) hydrogen, (ii) alkyl of 1 to 5 carbon atoms, (iii) alkenyl or alkynyl of 3 to 5 carbon atoms, the multiple bond thereof being in other than the α-position, (iv) alkyl of 1 to 4 carbon atoms substituted by cycloalkyl of 3 to 6 carbon atoms, (v) hydroxyalkyl of 2 to 5 carbon atoms, (vi) phenylalkyl of 7 to 11 carbon atoms in the aggregate thereof, (vii) phenylalkyl of 7 to 11 carbon atoms in the aggregate thereof monosubstituted in the phenyl thereof by halogen, alkoxy of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms, or (viii) A—CO—R_3,

wherein

A is alkylene of 1 to 4 carbon atoms, and

R_3 is alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy, phenyl or phenyl substituted by halogen,

R_1 and R_2 are identical or different and each is hydrogen, halogen or alkyl of 1 to 4 carbon atoms, and either (i) each of

X and Y is hydrogen, and the rings

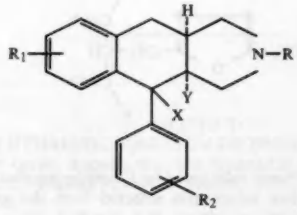
B and C are cis to each other, or (ii)

X and Y together are an additional bond,

or a pharmaceutically acceptable acid addition salt thereof.

93. (3aRS, 4SR, 9aSR)-3a4,9,9a,-tetrahydro-4-phenylbenz[*f*]isoindoline-2-trifluoroacetamide.

94. A compound of claim **1** of formula



wherein

each of X and Y is hydrogen,

R_1 is hydrogen, halogen or alkyl,

R_2 is hydrogen, and

R is

(i) hydrogen

(ii) alkyl of 1 to 5 carbon atoms

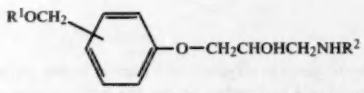
(iii) alkenyl of 3 to 5 carbon atoms, the multiple bond thereof being in other than the α position,
(iv) hydroxy-alkyl of 2 to 5 carbon atoms,
(v) phenylalkyl of 7 to 11 carbon atoms in the aggregate thereof,
(vi) —A—CO—R_3
wherein
A is alkylene of 1 to 4 carbon atoms, and
R_3 is phenyl or phenyl substituted by halogen.

4,171,370
PHENOXY-AMINO-PROPANOLS

Rochus Jonas; Karl-Heinz Becker; Hans-Joachim Enenkel; Klaus Minck, and Hans-Jochen Schliep, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 4, 1977, Ser. No. 839,487
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645710
Int. Cl.[2] A61K *31/36, 31/135;* **C07D** *317/06*
U.S. Cl. 424—282 **6 Claims**

1. Phenoxy-amino-propanols of the formula



wherein R^1 is alkenyl, alkynyl, alkoxyalkyl, alkenyloxyalkyl, with 2–6 C atoms in each case, or cycloalkyl with 3–8 C atoms; and R^2 is aralkyl wherein the aryl radical is monosubstituted by methylenedioxy, with a total of 7–15 C atoms, and the physiologically acceptable acid addition salts thereof.

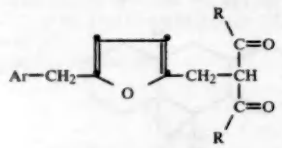
3. A method of achieving isoprenaline-antagonism on the heart rate or blood pressure in a mammal, which comprises administering to a mammal an amount of a compound of claim 1 which is effective for achieving isoprenaline-antagonism on the heart rate or blood pressure.

4,171,371
DIKETONES

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 830,470, Sep. 6, 1977, Pat. No. 4,153,719. This application Oct. 10, 1978, Ser. No. 949,779
Int. Cl.[2] A61K *31/36;* **C07D** *317/44*
U.S. Cl. 424—282 **5 Claims**

1. A compound of the formula



wherein:
Ar is phenyl or phenyl substituted by 3,4-methylenedioxy or from one to two substituents selected from the group consisting of hydroxy, alkoxy of 1–3 carbon atoms and halogen; and R is alkyl of 1 to 4 carbon atoms.

4. A composition for combatting viruses which comprises an antivirally effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

5. A method for combatting viruses which comprises contacting the locus of said viruses with a composition containing an antivirally effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

4,171,372
2,2-DIMETHYL-1,3-BENZODIOXOL-4-YL N-METHYLCARBAMATE OF CRYSTALLINE FORM A

Harold G. Haynes, Foxton Royston, and Robert W. Taylor, Rampton, both of England, assignors to Fisons Limited, London, England

Filed May 6, 1977, Ser. No. 794,651
Claims priority, application United Kingdom, May 8, 1976, 19019/76
Int. Cl.[2] A01N *9/28*
U.S. Cl. 424—282 **6 Claims**

1. 2,2-Dimethyl-1,3-Benzodioxol-4-yl N-methyl carbamate, at least 85% by weight of which is of crystalline form A characterized by an infra red spectrum exhibiting a peak at wavelength 733 cm^{-1} and a trough at wavelength 756 cm^{-1}.

4. A pesticidal composition comprising a pesticidally effective amount of 2,2-dimethyl-1,3-benzodioxol-4-yl N-methyl carbamate as claimed in claim 1 together with a carrier and/or a surface active agent.

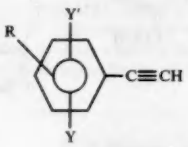
6. A method of combating pests at a locus infested or liable to be infested with pests, which method comprises applying to the locus a pest combating amount of a pesticidal composition as claimed in claim 4.

4,171,373
ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF TO TREAT PAIN, FEVER AND INFLAMMATION

Julius Diamond, Norris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Dec. 6, 1977, Ser. No. 858,005
Int. Cl.[2] A61K *31/10, 31/265*
U.S. Cl. 424—301 **14 Claims**

1. A method of treating inflammation, pain or fever in a warm-blooded animal which comprises administering to the animal an effective non-toxic amount of an active compound of the formula



wherein
R is hydrogen,
alkyl of 1 to 7 carbon atoms,
cycloalkyl of 5 to 7 carbon atoms,
1 to 7 carbon atoms alkyl substituted cycloalkenyl of 5 to 7 carbon atoms,
phenyl or
substituted phenyl where the substituent is Y″,
Y and Y′ are each selected from the group consisting of
hydrogen,
mercapto,
lower acylthio and lower alkyl thio;
Y″ is selected from the group consisting of:
Y,
lower alkyl, and
trifluoromethyl,
with the proviso that at least one of Y and Y′ is other than hydrogen.

4,171,374
ALKANOLAMINE DERIVATIVES

Leslie H. Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

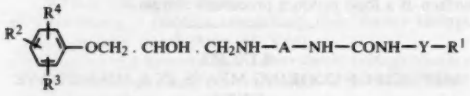
Division of Ser. No. 738,173, Nov. 2, 1976, Pat. No. 4,083,992, which is a division of Ser. No. 607,995, Aug. 26, 1975, Pat. No. 4,010,189, which is a division of Ser. No. 421,669, Dec. 4, 1973, Pat. No. 3,928,412. This application Feb. 16, 1978, Ser. No. 878,446

Claims priority, application United Kingdom, Dec. 15, 1972, 57970/72; Sep. 17, 1973, 43478/73

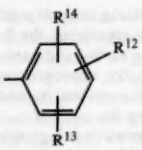
Int. Cl.[2] **A61K** *31/17, 31/215, 31/275;* **C07C** *127/19*

U.S. Cl. 424—304 **15 Claims**

1. An alkanolamine selected from compounds of the formula:



wherein A is alkylene of from 2 to 12 carbon atoms, wherein R^1 is hydrogen, or alkyl, halogenoalkyl, alkenyl or cycloalkyl each of up to 10 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, alkyl, cycloalkyl, alkenyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms; or aryl, aryloxy or aralkoxy each of up to 12 carbon atoms; or wherein R^2 and R^3 together, and/or R^{12} and R^{13} together, are trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; wherein R^4 is hydrogen, hydroxy or hydroxymethyl or aralkoxy of up to 12 carbon atoms; wherein R^{14} is hydrogen, amino or dialkylamino of up to 12 carbon atoms; and wherein when R^1 is hydrogen, alkyl, halogenoalkyl or alkenyl, Y is alkyleneoxy or alkylenecarbonyloxy each of up to 6 carbon atoms and when R^1 is cycloalkyl or aryl Y is alkylene, alkyleneoxy or alkylenecarbonyloxy each of up to 6 carbon atoms; and the acid-addition salts thereof.

4,171,375
CYCLOPENTANE DERIVATIVES AND THEIR PHARMACEUTICAL COMPOSITIONS

Michael P. L. Caton, Upminster; Trevor Parker, Romford, both of England, and Gordon L. Watkins, Santa Monica, Calif., assignors to May & Baker Limited, Essex, England

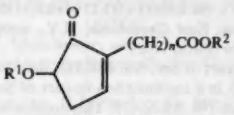
Filed Jan. 12, 1977, Ser. No. 758,797

Claims priority, application United Kingdom, Jan. 14, 1976, 1384/76

Int. Cl.[2] **A61K** *31/19, 31/20, 31/215, 31/22;* **C07C** *61/38, 69/145, 69/74, 69/78*

U.S. Cl. 424—305 **8 Claims**

1. A cyclopentane derivative of the formula:



wherein R^1 represents hydrogen, alkanoyl of 1 to 5 carbon atoms, or benzoyl, R^2 represents hydrogen or alkyl of 1 through 12 carbon atoms, and n represents an integer from 4 through 8 and, when R^2 represents a hydrogen atom, non-toxic pharmaceutically acceptable salts thereof.

4,171,376
ARYLOXYALKYL KETO-ESTERS

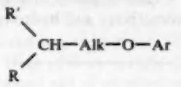
Joseph C. Collins, East Greenbush, and Guy D. Daiana, Stephentown, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 725,160, Sep. 21, 1976, Pat. No. 4,133,959, which is a continuation-in-part of Ser. No. 576,311, May 12, 1975, Pat. No. 4,031,246, which is a continuation-in-part of Ser. No. 381,406, Jul. 23, 1973, Pat. No. 3,933,837. This application Jun. 7, 1978, Ser. No. 913,454

Int. Cl.[2] **A01N** *9/24;* **A61K** *31/235;* **C09F** *5/00*

U.S. Cl. 424—308 **9 Claims**

1. A compound of the formula



wherein:

Alk is alkylene of 3 to 10 carbon atoms;

R is alkanoyl of 2 to 6 carbon atoms;

R′ is carboalkoxy of 2 to 6 carbon atoms;

and Ar is phenyl or phenyl substituted by one to three substituents selected from the group consisting of alkoxy of 1 to 4 carbon atoms and halogen.

9. A method for combatting viruses which comprises contacting the locus of said viruses with a composition containing an antivirally effective amount of at least one compound according to claim **1** in admixture with a suitable carrier or diluent.

4,171,377
OPHTHALMIC SOLUTION OF TRANEXAMIC ACID

Keith Green, Augusta, Ga., and Seymour F. Trager, Plainview, N.Y., assignors to Burton, Parsons & Co., Inc., Washington, D.C.

Filed Aug. 11, 1978, Ser. No. 932,795

Int. Cl.[2] **A61K** *9/20, 31/74, 31/79*

U.S. Cl. 424—319 **11 Claims**

1. A method for treating an eye having corneal epithelial wounds comprising topically applying to the cornea an aqueous ophthalmic solution comprising a therapeutically effective amount of tranexamic acid, whereby swelling in the cornea is reduced and the healing of epithelial wounds is enhanced.

4,171,378

ARYL SUBSTITUTED DIKETONES

Joseph C. Collins, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

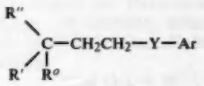
Continuation-in-part of Ser. No. 436,611, Jan. 25, 1974, Pat. No. 3,917,718, which is a continuation-in-part of Ser. No. 265,333, Jun. 22, 1972, Pat. No. 3,829,475. This application Jan. 30, 1975, Ser. No. 545,486

Claims priority, application United Kingdom, Jun. 18, 1973, 28793/73

Int. Cl.[2] **A01N** *9/24;* **C07C** *49/76*

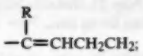
U.S. Cl. 424—331 **20 Claims**

1. A compound of the formula



wherein

Y is



R′ is lower-alkanoyl of 2 to 6 carbon atoms;

R″ is lower-alkanoyl of 2 to 6 carbon atoms;

R° is hydrogen;

R is hydrogen of lower-alkyl of 1 to 4 carbon atoms; and

Ar is phenyl, naphthyl, or phenyl substituted by from one to three monovalent substituents selected from the group consisting of lower-alkyl of 1 to 4 carbon atoms, lower-alkoxy of 1 to 4 carbon atoms, halogen, nitro, trifluoromethyl, trifluoromethoxy and hydroxy.

4,171,379

FEED SUPPLEMENT FOR BABY PIGS

Bud G. Harmon, Kirkwood; Leroy V. Skoch, Manchester, and Charles W. Dickerson, Des Peres, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Apr. 5, 1978, Ser. No. 893,735

Int. Cl.[2] **A23K** *1/00*

U.S. Cl. 426—2 **11 Claims**

1. A method of preventing iron deficiency in baby pigs comprising the steps of administering a hard nutrient feed block to the baby pigs, said block comprising about 1.5 to 3.5% by weight elemental iron, about 5 to about 30% by weight fat, about 3 to 15% magnesium oxide, about 1 to 9% phosphorous source, about 0.5 to 5.0% clay.

4,171,380

COOKED DOUGH ENVELOPE HAVING FROZEN FILLING AND METHOD THEREFOR

John H. Forkner, 2116 Mayfair Dr., Fresno, Calif. 93703

Filed Apr. 17, 1978, Ser. No. 896,711

Int. Cl.[2] **A21D** *13/08;* **A23G** *9/04*

U.S. Cl. 426—95 **16 Claims**

1. An edible food product comprising an edible moist filling disposed within an edible envelope, the envelope comprising an external layer of cereal dough and a protective edible backing layer interposed between the dough layer and the filling, the envelope having a seal formed by overlapping margins of the dough layer, the backing layer being confined to the inner side of the dough layer which is faced toward the filling and forming a thermal barrier.

4,171,381

SMOKE COLORED FOOD CASING AND METHOD OF PRODUCING SAME BY USE OF A MAILLARD REACTION PRODUCT AND AN ALBUMIN

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,769

Int. Cl.[2] **A22C** *13/00*

U.S. Cl. 426—105 **36 Claims**

1. A food casing comprising a casing having a coating over a surface thereof, said coating comprising an albumin and a product from the reaction of a reducing sugar with an amino compound selected from the group consisting of an amino acid, an amino acid derivative, and a mixture thereof, said coated casing being suitable for stuffing with a food product and suitable for imparting a smear resistant smoke color to the surface of a food product processed therein.

4,171,382

METHOD OF COOKING MEATS IN A MICROWAVE OVEN

Ronald G. Buck, Burnsville, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 30, 1977, Ser. No. 829,080

Int. Cl.[2] **A23L** *1/31;* **H05B** *9/06*

U.S. Cl. 426—243 **4 Claims**

1. A method for cooking meat in a microwave oven of the type having means for measuring the humidity and temperature of the oven heating cavity, and having oven control means including a programmable microprocessor for receiving signals indicative of said measured humidity and temperature, said method comprising the steps of:

(a) energizing a microwave energy source to provide microwave energy to said oven heating cavity whereby a substantial portion of said energy is absorbed by a meat body located in said oven heating cavity;

(b) measuring the humidity and temperature of said oven heating cavity at a plurality of time-spaced intervals as said meat body is heated and providing signals indicative of said measured quantities to said microprocessor;

(c) calculating in said microprocessor a humidity-time curve described by said measured quantities and determining in said microprocessor the area under said curve;

(d) comparing in said microprocessor said calculated area with the area of a predetermined characteristic humidity-time curve for meat bodies stored in a memory portion of said microprocessor and calculating in said microprocesor from said comparison the net heat loss due to evaporation, a microwave power absorption factor and a power loss factor for said meat body;

(e) further calculating in said microprocessor the mean internal temperature of said meat body as a function of the sum of its initial temperature said net evaporative heat loss, said microwave power absorption factor and said power loss factor;

(f) comparing in said microprocessor said calculated mean internal temperature with an operator selected doneness temperature for said meat body; and,

(g) de-energizing said microwave energy source when said operator selected doneness temperature is reached.

4,171,383

WET MILLING PROCESS FOR REFINING WHOLE WHEAT

Vincent P. Chwalek, Los Angeles, Calif., and Richard M. Olson, North Riverside, Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 11, 1978, Ser. No. 904,952

Int. Cl.[2] **A23K** *1/00*

U.S. Cl. 426—623 **20 Claims**

1. A continuous wet wheat refining process, which comprises:

(A) cleaning whole wheat kernels to separate the extraneous vegetable matter;
(B) wet milling whole wheat kernels by sequentially:
(a) steeping the whole wheat kernels,
(b) removing the soaked wheat kernels from steeping and milling them while wet to reduce the particle size,
(c) separating the milled kernels of (b) into a first fraction comprising germ, fiber (bran) and smaller endosperm particles, and a second fraction comprising larger endosperm particles,
(d) decreasing the particle size of the endosperm particles in the wet second fraction of (c), and
(e) combining the first fraction of (c) comprising germ, fiber (bran) and smaller endosperm particles with the second fraction from (d) comprising endosperm particles of decreased size and steeping the composite to form a mill starch slurry,
(C) separating a fraction comprising fiber (bran) tailings from the mill starch slurry of (B)(e);
(D) washing and dewatering the fiber (bran) tailings fraction of (C) and combining the washwater with the defibered mill starch slurry of (C);
(E) separating the composite of (D) into a starch-rich fraction and a protein-rich fraction;
(F) concentrating and dewatering the protein-rich fraction of (E) to obtain a dewatered protein-rich fraction and filtrate;
(G) evaporating at least a portion of the filtrate of (F) to increase the concentration of solids;
(H) combining the cleanings of (A), the dewatered fiber (bran) tailings fraction of (C), the aqueous concentrate of (G) and the dewatered protein-rich fraction of (F) to provide a wet animal feed product; and
(I) drying the wet feed product of (H) to provide a final animal feed product.

4,171,384

COMBINED DRY-WET MILLING PROCESS FOR REFINING WHEAT

Vincent P. Chwalek, Los Angeles, Calif., and Richard M. Olson, North Riverside, Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 11, 1978, Ser. No. 904,953
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—623 **12 Claims**

1. A continuous wheat refining process, which comprises:
(A) dry milling whole grain wheat to provide
(a) an endosperm fraction,
(b) a germ fraction,
(c) a fiber (bran) fraction, and
(d) a cleanings fraction;
(B) wet milling the single endosperm fraction of (A)(a) by sequentially
(i) steeping the endosperm fraction,
(ii) separating the larger wet endosperm particles from the smaller wet endosperm particles,
(iii) milling the larger wet endosperm particles to reduce their particle size,
(iv) recombining the wet endosperm particles of (ii) and (iii) into a single fraction, and
(v) steeping the endosperm fraction again to provide a mill starch slurry;
(C) separating fine fiber tailings from the mill starch slurry of (B)(v);
(D) separating the defibered mill starch slurry of (C) into a starch-rich fraction and a protein-rich fraction;
(E) concentrating the protein-rich fraction of (D);
(F) directly combining each of the fiber (bran) fraction, the cleanings fraction and the germ fraction of (A), the fine fiber tailings fraction of (C) and the protein-rich concentrate of (E) to provide a wet animal feed product; and
(G) drying the wet feed product of (F) to obtain a final animal feed product.

4,171,385

ANIMAL FEED BLOCK CONTAINING MAGNESIUM OXIDE

Leroy V. Skoch, Manchester, and Dean E. Hodge, St. Louis, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Apr. 5, 1978, Ser. No. 893,734
Int. Cl.[2] A23K *1/02*
U.S. Cl. 426—658 **10 Claims**

1. A process for preparing a molasses based feed block which comprises: admixing about 18 to 74% by weight molasses, a water soluble phosphorous source selected from the group consisting of ammonium polyphosphate and tetrasodium pyrophosphate, about 0.5 to 5% by weight water absorbent clay and 5–30% water under high speed shearing action for an effective amount of time to disperse the clay, admixing about 5 to 30% by weight animal fat and magnesium oxide in an amount effective to obtain a viscous nutrient mixture that solidifies to form a hard weather resistant block said block having a water activity of 0.8 to 0.9.

4,171,386

ANIMAL FEED BLOCK CONTAINING FERROUS SULFATE AND MAGNESIUM OXIDE

Leroy V. Skoch, Manchester; Bud G. Harmon, Kirkwood, and Charles W. Dickerson, Des Peres, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Apr. 5, 1978, Ser. No. 893,736
Int. Cl.[2] A23K *1/02*
U.S. Cl. 426—658 **10 Claims**

1. A process for preparing an animal feed block which comprises mixing about 18 to 65% by weight molasses, about 4 to 9% by weight monobasic salt of phosphoric acid, about 0.5 to 5% by weight water absorbent clay and 5 to 20% water under high speed shearing action for an effective amount of time to disperse the clay, admixing 5 to 30% animal fat, about 8% by weight ferrous sulfate and about 3 to about 15% by weight magnesium oxide to obtain a viscous nutrient mixture that solidifies to form a hard weather resistant block within one hour at room temperature, said block having a water activity of from 0.8 to 0.9.

4,171,387

COATING WOOD SUBSTRATES

Ozzie Fogle, and James Cooley, both of Orangeburg, S.C., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 6, 1978, Ser. No. 875,419
Int. Cl.[2] B05D *3/06, 5/10*
U.S. Cl. 427—54 **6 Claims**

1. A method of forming a coated substrate selected from the group consisting of plywood, composition board, lauan and hardboard, which comprises applying to said substrate a urethane adhesive having about 25–35% solids content, drying said adhesive, applying on to said adhesive an ultraviolet curable polyacrylate resin composition comprising about 77–89% solid polyacrylate resin, about 10–20% silica pigment and about 1–3% photo-initiator, and thereafter curing the composite resulting structure by exposure thereof to ultraviolet radiation.

4,171,388

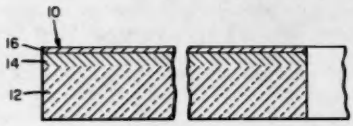
MAGNETIC RECORDING AND STORAGE DEVICE HAVING HIGH ABRASION RESISTANCE AND METHOD

Richard E. Allen, Corning, and Peter R. Segatto, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 383,889, Jul. 30, 1973, abandoned, which is a continuation of Ser. No. 177,313, Sep. 2, 1971, abandoned. This application Dec. 8, 1977, Ser. No. 858,566

Int. Cl.[2] H01F *10/00*

U.S. Cl. 427—129 **9 Claims**



1. The method for producing an abrasion and wear resistant magnetic recording and storage device comprising the steps of

providing a magnetic recording and storage device, said device having a solid magnetic film chemically bonded to a substrate, said solid magnetic film being a material selected from the group consisting of magnetite, gamma ferric oxide, cobalt in combination with magnetite, and cobalt in combination with gamma ferric oxide,

applying a film of an organic lubricating material over the surface of said magnetic film, said organic lubricating material selected from the group consisting of a silicone based chlorosilane, polyethylene, polyoxyethylene monostearate, morpholino stearate, triethanolamine stearate and mixtures thereof, and

removing any excess lubricating material from the surface of the magnetic film by polishing said film of lubricating material such that a film of less than 5000 Å of lubricating material remains on the surface of said magnetic film.

4,171,389

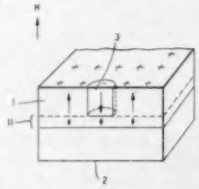
PROCESS FOR SUPPRESSING HARD BUBBLES IN MAGNETIC BUBBLE DEVICES

Ernst M. Gyorgy, Madison; Roy C. LeCraw, Summit, and Raymond Wolfe, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 558,142, Mar. 13, 1975, abandoned. This application Jul. 6, 1976, Ser. No. 702,392

Int. Cl.[2] H01F *10/02*

U.S. Cl. 427—130 **7 Claims**



1. A method for suppressing hard bubbles in a magnetic bubble device comprising an epitaxial magnetic garnet film deposited on a nonmagnetic garnet substrate, said substrate containing ions selected from the group consisting of aluminum ions and gallium ions and said ions having a concentration in the substrate substantially greater than in the film CHARACTERIZED IN THAT said magnetic bubble device is annealed at a temperature in the range of from 1000° C. to 1200° C. and with at least a portion of said film exposed to an inert atmosphere whereby the magnetic moment is significantly altered in a layer of said portion of said film adjacent to said substrate.

4,171,390

PROCESS FOR PREPARING FILTER MATERIAL

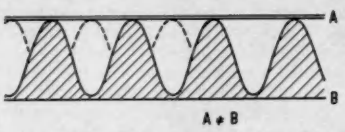
Karl Hilterhaus, Georgsmarienhütte, Oesede; Franz G. Reuter, Lemförde, both of Fed. Rep. of Germany, and Reuter Technologie GmbH, 13, Lemforde, both of Fed. Rep. of Germany, assignors to Chemie-Anlagenbau Bischofsheim GmbH. Osnabrück Reuter Technologie GmbH Lenförd, both of Germany

Continuation of Ser. No. 641,174, Dec. 16, 1975, abandoned. This application May 17, 1978, Ser. No. 907,017

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1974, 2460835

Int. Cl.[2] B05D *5/00*

U.S. Cl. 427—244 **6 Claims**



1. A process of producing a porous polyurethane resin filter material comprising:

(a) providing a first solution containing 60 to 80% by weight of an NCO-adduct having 1.5 to 5% free isocyanate groups dissolved in a highly polar organic solvent;

(b) providing a second solution containing a highly polar organic solvent and at least one member selected from the group consisting of hydrazine hydrate, carbodihydrazide, piperazine and 1,4-diaminopiperazine and in which solution said member is present in an amount of from 0.02 to 0.05 mole percent;

(c) admixing said first solution into said second solution over an extended period of time during which the NCO preadduct and said member of said second solution react to form a highly viscous reaction product and continuing the admixing of said first solution into said second solutions and monitoring the viscosity measured under reaction conditions until the viscosity of the admixture is such that the addition of even the minutest amount of said first solution would have resulted in instantaneous gelling of the admixture, and at which point the addition of said first solution is stopped immediately, the final admixture thus produced having a solids content of between 15 and 35% by weight and remaining castable for at least 24 hours;

(d) coating the final admixture on a textile reinforcing material;

(e) introducing the textile material having the coating of said final admixture into a coagulating bath of water to form a polyurethane sheet structure; and

(f) drying said sheet structure to form said porous polyurethane resin filter material.

4,171,391

METHOD OF PREPARING COMPOSITE SHEET MATERIAL

Gordon M. Parker, Wilmington, Del., assignor to Wilmington Chemical Corporation, Wilmington, Del.

Filed Sep. 7, 1978, Ser. No. 940,389

Int. Cl.[2] B05D *5/00, 3/02, 1/18*

U.S. Cl. 427—246 **29 Claims**

1. A method of preparing a composite sheet material comprising:

(a) impregnating at least a portion of a porous sheet material with an aqueous ionic dispersion of a polyurethane polymer having solubilizing ionizable groups covalently bonded to the polymer chain which are reacted with an ionic dispersing agent, said polyurethane polymer having substantially no unreacted N=C=O groups;

(b) ionically coagulating said polyurethane polymer from said dispersion impregnated in said porous sheet material; and

(c) drying said impregnant to form a composite sheet material.

4,171,392

PROCESS OF PRODUCING ONE-SIDE ALLOYED GALVANIZED STEEL STRIP

William C. Sievert, Chesterton; James B. Cundiff, La Porte; Peter A. Klobuchar, Munster; Larry H. Lindberg, Valparaiso, and James A. Kargol, Notre Dame, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Nov. 8, 1978, Ser. No. 958,800
Int. Cl.[2] C23C *1/02*
U.S. Cl. 427—321 **5 Claims**

1. A continuous process for consistently producing a hot-dip galvanized ferrous metal strip having a paintable zinc-iron intermetallic coating on one lateral surface and an adherent formable coating of metallic zinc on the opposite lateral surface comprising; continuously passing an endless strip of galvanizing steel having a substantially uniform thickness at a controlled line speed along a heat treat in-line continuous hot-dip galvanizing line which provides a clean metallic surface free of oxides and contaminates which is adapted for coating in a hot-dip galvanizing bath, controlling the temperature of the strip at a temperature about 50° F. above the hot-dip galvanizing bath temperature measured at the turn-down ball prior to immersing the strip in the hot-dip galvanizing bath having an aluminum coating of between about 0.13 and 0.20 wt. % aluminum, maintaining the zinc hot-dip coating bath at a temperature between about 477° C.–482° C. (890° F. and 900° F.) while the strip remains in the bath for a period of between about 3 and 5 seconds, passing the strip from the hot-dip galvanizing bath between coating weight control means comprising gas jets which remove molten zinc from the surface of the strip to provide on one side a uniform light weight zinc hot-dip coating having a maximum weight of 30 g/m^2 which does not vary in weight more than 3 to 6 g/m^2 and a uniform heavier weight zinc coating on the opposite side of the strip, passing said strip while the light weight coating is still molten through a heating zone which heats the strip from a temperature of about 427° C. (800° F.) to a peak temperature between about 482° C.–524° C. (900° F.–975° F.) within a period of about 3 to 5 seconds to transform all of the zinc remaining in the light weight coating into a uniform zinc-iron intermetallic surface coating which is free of metallic zinc and which contains at least 6 wt. % iron without forming a subsurface zinc-iron intermetallic layer on the opposite side of the strip having a thickness which impairs the formability of the zinc coating on the other side of the strip and immediately thereafter allowing said strip to cool from said peak temperature to below the melting point of said zinc coatings.

4,171,393

ELECTROLESS PLATING METHOD REQUIRING NO REDUCING AGENT IN THE PLATING BATH

Samuel W. Donley, and Peter N. Bacel, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,225
Int. Cl.[2] B05D *1/18*; C23C *3/00*
U.S. Cl. 427—354 **15 Claims**

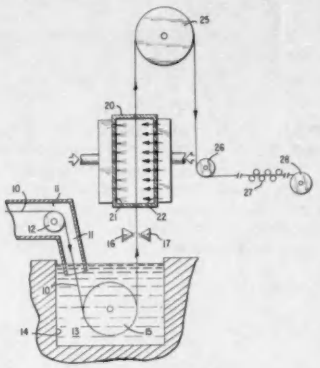
1. A method for electroless plating on a porous metal surface, said method comprising immersing an article having a porous metal surface in an aqueous electroless plating solution comprising cations of a plating metal which is more electronegative than said porous metal to accomplish a sustained metal-metal ion displacement reaction, said aqueous electroless plating solution having an alkaline pH and being substantially free of any chemical reducing agent for said cations other than said porous metal; said porous metal being a catalyst for said displacement reaction; and the pores of said porous metal surface being large enough to enable the plating solution to wet the internal surfaces of said pores and to enable cations of said porous metal to diffuse into the plating solution, but not large enough to allow the plating solution to circulate freely into said pores.

4,171,394

PROCESS OF HOT-DIP GALVANIZING AND ALLOYING

Ram S. Patil, Munster, and Frederick F. Jones, Jr., Highland, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Nov. 30, 1977, Ser. No. 855,839
Int. Cl.[2] C23C *1/02*
U.S. Cl. 427—374 C **5 Claims**



1. A continuous process for producing a galvanized ferrous metal strip on a continuous hot-dip coating line having a zinc-iron alloy surface coating on one lateral surface thereof comprising, continuously moving an endless ferrous metal strip through a hot-dip coating bath providing a hot-dip zinc coating on both lateral surfaces with one said zinc coating being a light zinc coating having a weight not exceeding about 0.25 ounces per square foot and preferably less than about 0.10 ounces per square foot, heating a surface area of said light zinc coating with heating means disposed in a treating zone and simultaneously cooling the surface of the other zinc coating in an area directly opposite said area being heated while said strip is moving through said treating zone by cooling means disposed in said treating zone, said heating transforming said light zinc coatng into a zinc-iron alloy surface coating and said cooling maintaining said other zinc coating during heating in said treating zone below a temperature at which there is significant increase in the thickness of the subsurface zinc-iron intermetallic alloy layer of said other zinc coating.

4,171,395

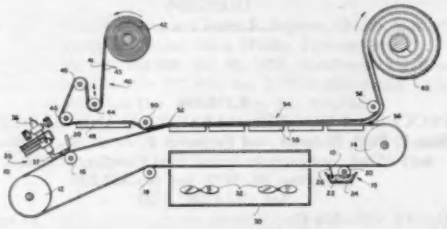
METHOD AND APPARATUS FOR FORMING A LAYER OF FOAM URETHANE ON A CARPET BACKING AND PRODUCT

John G. Tillotson, Rte. 1, Box 20, Dalton, Ga. 30720

Filed Mar. 30, 1977, Ser. No. 782,636
Int. Cl.[2] B32B *3/02*
U.S. Cl. 428—95 **13 Claims**

1. A carpet product having a fabric backing and a layer of blown cellular urethane material integrally bonded to the undersurface of said fabric backing, said cellular urethane material having a density of between one pound per cubic foot and ten pounds per cubic foot, a thickness of between one

sixteenth of an inch and one inch, an homogeneous cell structure substantially free of cells having a diameter larger than



one eighth of an inch, and being substantially free of longitudinal wrinkles.

4,171,396

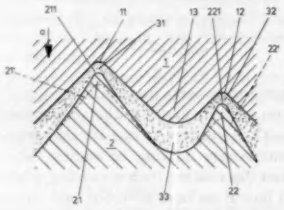
ARTICLE MOLDED FROM FIBROUS MATERIAL

Edmund E. Munk, and Herbert G. Haas, both of Oberstenfeld, Fed. Rep. of Germany, assignors to Werzalit-Pressholzwerk J.F. Werz Jr. KG, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 571,619, Apr. 25, 1975, which is a division of Ser. No. 340,934, Mar. 13, 1973, Pat. No. 4,078,030. This application Dec. 19, 1977, Ser. No. 861,640

Int. Cl.[2] B32B *3/30*

U.S. Cl. 428—171 **10 Claims**



1. A shaped article comprising a rigid body of a densified mixture which includes particulate material and a binder, said body having an outer surface provided with at least one elongated ridge having a pair of side faces including an angle with each other and terminating in a tip constituting an edge of said ridge and an inner surface forming in the region of said ridge an elongated cavity aligned in longitudinal direction with said ridge, said cavity having an inner end adjacent said tip and which is spaced from said tip a distance smaller than the spacing of any other point of said inner surface from an opposite point of the outer surface, and said body having in the region of said tip a greater density than in the remainder of said body, to assure that said body has a non porous surface even at the edge of said ridge.

4,171,397

SHEET MATERIAL HAVING COMPOSITE FLUOROCHEMICAL-SILICONE RELEASE COATINGS

Charles M. Morrow, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 17, 1978, Ser. No. 897,753

Int. Cl.[2] B32B *3/10, 27/08*

U.S. Cl. 428—195 **13 Claims**

1. Sheet material provided with a composite release surface comprising first and second coatings on at least one side, normally tacky and pressure-sensitive adhesive adhering less strongly to the coatings than to the same sheet material in the absence of the coatings, the exposed release surface consisting essentially of areas of said first coating and other areas of said second coating

said first coating consisting essentially of a solid fluorochemical polymer having surface energy characteristics such that a drop of 100% ethanol forms a contact angle of at least 30° when placed on the surface of a smooth dry film of said fluorochemical polymer, and

said second coating consisting essentially of a cured silicone polymer consisting essentially of polydimethylsiloxane gum, crosslinked with polymethylhydrogensiloxane, whereby pressure-sensitive adhesive exhibits an average adhesion to the composite release surface in the range of 8-350 g/cm width, less than to said first coating alone and greater than to said second coating alone.

4,171,398

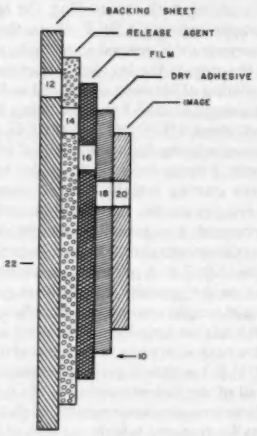
TRANSFER SHEET

Delbert R. Hunt, 2860 Amherst Ave., Fullerton, Calif. 92631

Continuation-in-part of Ser. No. 730,224, Oct. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,921, Jul. 21, 1975, abandoned. This application Oct. 31, 1977, Ser. No. 846,711

Int. Cl.[2] B32B *7/06*; B44C *1/16*

U.S. Cl. 428—195 **9 Claims**



1. A transfer consisting of:

(a) a non-opaque flexible backing;

(b) a non-opaque film heat stable below 350° F. (177° C.) on one surface of the backing;

(c) a coating of dry-non-activated adhesive on the surface of the film not on the backing;

(d) an image of dry material on the surface of the coating of adhesive not on the surface of the film.

4,171,399

MAGNETIC RECORDING AND STORAGE DEVICE HAVING HIGH ABRASION RESISTANCE AND METHOD

Richard E. Allen, Corning, and Peter R. Segatto, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 383,889, Jul. 30, 1973, which is a continuation of Ser. No. 177,313, Sep. 2, 1971, abandoned. This application Dec. 8, 1977, Ser. No. 858,567

Int. Cl.[2] H01F *10/00*

U.S. Cl. 428—336 **12 Claims**

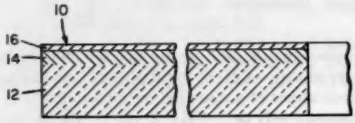
1. A magnetic recording and storage device having high abrasion and wear resistance comprising

a substrate,

a solid magnetic film chemically bonded to a surface of said substrate, and

a lubricating film disposed directly on the surface of said

magnetic film, said lubricating film being material selected from the group consisting of a silicone based chlorosilane,



polyethylene, polyoxyethylene monostearate, morpholino stearate, triethanolamine stearate, and mixtures thereof.

4,171,400

SHAPED PRESS-FORGED NORMALLY FRANGIBLE INORGANIC CRYSTALS

King H. Rosette, Chagrin Falls, and Herbert Packer, Cleveland Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Continuation of Ser. No. 649,247, Jan. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 307,939, Nov. 20, 1972, Pat. No. 3,933,970. This application Feb. 6, 1978, Ser. No. 875,317

Int. Cl.[2] G02B *5/00*; G02C *7/00*

U.S. Cl. 428—357 **12 Claims**

1. A shaped, polycrystalline optical body of alkali metal halide or alkaline earth metal halide, composed of crystals oriented with axes in a radial direction, with the crystals in the center portion of said body having an average size substantially larger than the size of the crystals near the periphery thereof, said body having essentially the same optical properties as a single crystal of said halide.

4,171,401

ARTIFICIAL STRAW MAKING STABLE-LITTERS

Georges Legrix, Route de Bordeaux, 64230 Sauvagnon-Pau; Gérard Junca, Jurançon; Michel Bouron, Pau, and Pierre Rustul, Orthez, all of France, assignors to Georges Legrix, Sauvagnon and Ato Chimie, Courbevoie, both of, France

Filed Sep. 8, 1977, Ser. No. 831,419

Claims priority, application France, Sep. 9, 1976, 76 27769; Jul. 18, 1977, 77 21870

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—369 **18 Claims**

1. A stable litter comprising loose chips composed of a polymeric substance selected from the group consisting of crystalline thermoplastic alimentary polymers having an elongation at rupture of at least 50%, and having, when in the flat and stretched condition, a shape and dimensions such that each chip is inscribable in a parallelepiped having a length comprised between 30 and 800 mm, a width comprised between 1 and 20 mm and a height comprised between 0.06 and 12 mm, the thickness of said chips being comprised between 0.06 and 0.8 mm.

4,171,402

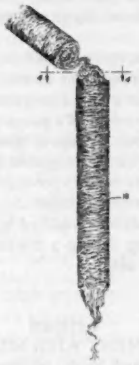
TEXTURED YARN PRODUCT

Brewster B. Eskridge; Roger H. Fink; William D. Porter, all of Asheville, and Elbert K. Warren, Candler, all of N.C., assignors to Akzona, Inc., Asheville, N.C.

Division of Ser. No. 681,252, Apr. 28, 1976, Pat. No. 4,095,317, which is a division of Ser. No. 517,802, Oct. 24, 1974, Pat. No. 3,983,610. This application Apr. 13, 1978, Ser. No. 896,060

Int. Cl.[2] D02G *1/00*

U.S. Cl. 428—369 **5 Claims**



1. A compacted mass of a synthetic polymeric yarn comprising a multiplicity of continuous yarn filaments compacted into a semi-rigid body having a substantially longitudinal axis and an elongated rod-shape, the major proportion of the yarn filaments having portions that are arranged at an angle to the longitudinal axis with intermediate portions of the filaments forming alternate inwardly and outwardly curved folds.

4,171,403

GLASS FIBER COATED WITH A HYDROXY-ETHYLATED STARCH, A TERTIARY AMINE ETHERIFIED STARCH, AND A METHYL METHACRYLATE LATEX POLYMER OR CO-POLYMER

Harold L. Haynes, Granville, and Albert R. Morrison, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 28, 1977, Ser. No. 763,391

Int. Cl.[2] B32B *9/00*; D02G *3/00*

U.S. Cl. 428—392 **5 Claims**

5. At least one glass fiber at least a portion of the surface of which is in contact with a residue formed by removing water from an aqueous composition comprising in percent by weight of said aqueous composition a hydroxy ethylated potato starch in an amount of about 3.1 percent, a tertiary amine etherified corn starch in an amount of about 1 percent, a methyl-methacrylate latex in an amount of about 1 percent, a hydrogenated coconut oil in an amount of about 0.8 percent, a paraffin wax having a melting point of about 125° F. in an amount of about 0.9 percent, a first emulsifier in an amount of about 0.1 percent, a second emulsifier in an amount of about 0.1 percent, a cationic lubricant in an amount of about 0.2 percent, a non-starch film former in an amount of about 0.1 percent and an inhibitor in an amount of about 0.0001 percent.

4,171,404

POLYMER-MODIFIED, ACID DYEABLE POLYESTER AND POLYOLEFIN TEXTILE MATERIALS AND METHOD FOR PRODUCING SAME

Clifford C. Carroll, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 770,879, Feb. 22, 1977, abandoned. This application Apr. 5, 1978, Ser. No. 893,924

Int. Cl.[2] **B32B** *27/38, 27/06, 27/32;* **B05D** *3/02*

U.S. Cl. 428—413 **20 Claims**

12. A vinyl-coated, acid dyed, polymer-modified textile material consisting essentially of polyester or polyolefin fibers which comprises:

a textile material substrate formed of polyester or polyolefin fibers having impregnated therein from about 0.1 to 10 weight percent of a cured polymeric constituent formed as the reaction product of a polyamide and a polyepoxide having at least two 1,2-epoxy groups per molecule and wherein the polymer impregnated substrate has been dyed with an anionic dyestuff to provide an acid dyed polymer-modified textile material substrate; and a vinyl coating on said acid dyed polymer-modified textile material substrate, said vinyl coating having a thickness of from about 0.1 mils to about 50 mils.

4,171,405

ASBESTOS TREATMENT WITH METAL MOLYBDATES

Paul A. Pezzoli, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 3, 1977, Ser. No. 756,141

Int. Cl.[2] **B32B** *19/04*

U.S. Cl. 428—443 **41 Claims**

1. A method of treating asbestos to reduce its hemolytic activity comprising depositing on at least a portion of the asbestos a material consisting essentially of at least one hemolysis-reducing metal molybdate in an amount of 0.5 to 5.0 percent by weight, based on the weight of the asbestos.

29. A fibrous asbestos material consisting essentially of asbestos fibers having deposited thereon at least one hemolysis-reducing metal molybdate about 0.05 to 5.0 percent by weight, based on the asbestos.

4,171,406

MAGNETIC RECORDING MEDIUM

Nobutaka Yamaguchi, Odawara; Masahiro Utumi, Odawara; Masaaki Fujiyama, Odawara, and Masakazu Yoneyama, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 6, 1978, Ser. No. 922,413

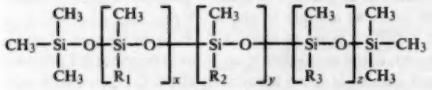
Claims priority, application Japan, Jul. 6, 1977, 52-80780

Int. Cl.[2] **H01F** *10/02*

U.S. Cl. 428—447 **9 Claims**

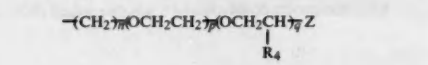
1. A magnetic recording medium having a running speed below 5 cm/sec comprising a non-magnetic support having thereon a magnetic recording layer comprising finely divided ferromagnetic powders in a binder, wherein

(1) the magnetic recording layer contains about 0.1 to about 5% by weight based on the weight of said finely divided ferromagnetic powder of at least one alkylpolysiloxane having a hydrophilic group in the side chain thereof, represented by the formula (I) below

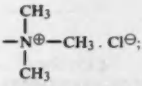


(I)

wherein R_1 and R_2, which may be the same or different, each represents $-CH_3$ or



provided that R_1 and R_2 are not simultaneously $-CH_3$; R_3 represents $-CH_3$ or the aliphatic chain having 10 to 18 carbon atoms of a saturated or unsaturated fatty acid; R_4 represents —H or $-CH_3$; Z represents an ionic group, which renders the alkylpolysiloxane water-soluble, selected from the group consisting of $-OSO_3Na$, $-COOR_5$ wherein R_5 is H, Na or K, and



x represents a number of from 3 to 50; y represents a number of from 2 to 50; z represents 0 or a number of from 1 to 10; x+y+z is a number of from 5 to 100; n is 0 or a number of from 1 to 5; p is 0 or a number of from 1 to 50; and q is 0 or a number of from 1 to 50, and

(2) the magentic recording layer has a Young's modulus of at least 1×10^{10} dyne/cm^2.

4,171,407

METHOD OF MAKING AQUEOUS EMULSIONS OF ACRYLATE COPOLYMERS IN THE PRESENCE OF A DEGRADED STARCH PROTECTIVE COLLOID

Wilhelm Elser, Graefenhausen; Klaus Huebner, Ober-Ramstadt-Eiche; Hans Ottofrickenstein, Darmstadt-Eberstadt, and Hans Boessler, Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 733,325, Oct. 18, 1976, Pat. No. 4,104,227. This application Dec. 15, 1977, Ser. No. 860,826

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659133

Int. Cl.[2] **B32B** *27/06;* **C08L** *3/02*

U.S. Cl. 428—500 **5 Claims**

1. The method of making an aqueous emulsion polymer having a minimum film-forming temperature below 50° C. and adaptable to use as a binder in coating agents forming non-blocking coatings, which method comprises emulsion polymerizing a monomer mixture comprising (A) 80 to 95.5 percent by weight of at least one acrylic acid alkyl ester, alone or in combination with a member selected from the group consisting of methacrylic acid alkyl esters and styrene, of which at least 30 percent by weight is an acrylic acid alkyl ester having 1 to 8 carbon atoms in the alkyl portion; (B) 0.5 to 5 percent by weight of an unsaturated polymerizable carboxylic acid or of a salt thereof; and (C) 0 to 19.5 percent by weight of other free-radically polymerizable monomers, in the presence of 1 to 5 percent, by weight of said monomers, of a protective colloid which is a degraded starch having a viscosity, in the form of a 10% solution in 1 N sodium hydroxide, of less than 15 mPa . s at a velocity gradient $D=532.1\ s^{-1}$.

3. An aqueous emulsion polymer prepared by the method of claim 1.

5. The method of forming a non-blocking coating on a substrate which comprises applying thereto a coating agent comprising, as its binder component, a film-forming aqueous emulsion polymer as in claim 3.

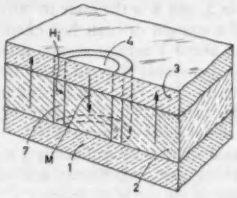
4,171,408
DEVICE OPERATING ON THE DISPLACEMENT OF MAGNETIC DOMAIN WALLS

Franciscus H. de Leeuw, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 701,635, Jul. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 631,161, Nov. 11, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 861,722

Int. Cl.[2] H01F *10/02*

U.S. Cl. 428—539 **5 Claims**



1. A device operating by displacement of magnetic domain walls comprising a first layer of magnetic monocrystalline garnet, said layer having an easy axis of magnetization normal to said layer, means to generate magnetic domain walls in said layer, said layer having a plurality of fixed positions for the domain walls, a second layer of magnetic monocrystalline garnet in direct contact with said first layer, said second layer having an easy axis of magnetization normal to the plane of the second layer and a magnetization differing from that of said first layer, whereby a non-homogeneous distribution of the magnetization in the domain walls in the direction of height is produced which results in an internal field directed parallel to the plane of the first layer being present which enhances the propagation velocity of the domain walls, and displacement means for moving magnetic domain walls between previously determined positions.

4,171,409
METHOD AND APPARATUS FOR GENERATING POWER UTILIZING REVERSE ELECTRODIALYSIS

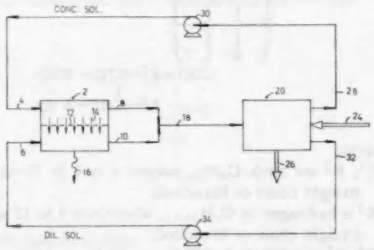
Sidney Loeb, Warrenton, Va., assignor to Ben Gurion University of the Negev, Beersheba, Israel

Filed Feb. 15, 1978, Ser. No. 877,988

Claims priority, application Israel, Feb. 25, 1977, 51542

Int. Cl.[2] H01M *8/04*

U.S. Cl. 429—17 **9 Claims**



1. A method of generating power, comprising:

(A) passing a concentrated ionic solution through a first pathway in a reverse electrodialysis unit including a membrane stack having alternating cation and anion exchange membranes and an electrode at each end of the stack

(B) passing a dilute ionic solution through a second pathway in said reverse electrodialysis unit, whereby solute from the concentrated solution in the first pathway passes through the membranes to the dilute solution in the second pathway, this being accompanied by the generation of an output electrical current and voltage;

(C) regenerating by thermal separation the original concentrated and dilute ionic solutions from the solutions exiting from the reverse electrodialysis unit; and

(D) recycling said regenerated and dilute solutions back through said respective first and second pathways in the reverse electrodialysis unit.

6. A heat-engine for generating power, comprising:

(A) a reverse electrodialysis unit including a membrane stack having alternating cation and anion exchange membranes, an electrode at each end of the stack, a first pathway through the reverse electrodialysis unit for a concentrated ionic solution, and a second pathway through the reverse electrodialysis unit for a dilute ionic solution;

(B) means for introducing a concentrated ionic solution into said first pathway;

(C) means for introducing a dilute ionic solution into said second pathway, whereby solute from the concentrated solution in the first pathway passes through the membranes to the dilute solution in the second pathway, this being accompanied by the generation of an output electrical current and voltage;

(D) thermal separation means for regenerating the original concentrated and dilute ionic solutions from the solutions exiting from the reverse electrodialysis unit; and

(E) recycling means for recycling said regenerated concentrated and dilute solutions back to said first and second pathways in the reverse electrodialysis unit.

4,171,410
ELASTIC BODY AND METHOD OF MAKING SAME

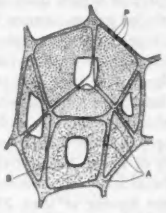
Gerd Frob, Ulm, Fed. Rep. of Germany, assignor to Mayser-GmbH & Co., Ulm, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,272

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729738

Int. Cl.[2] B32B *3/26*

U.S. Cl. 521—52 **10 Claims**



1. A method of making a conductive and compressible body, said method comprising the steps of sequentially:

coating the strands of a reticulate and generally nonconducting synthetic-resin foam body with a layer of generally conductive particles of a particle size greatly smaller than the cell size of the foam of said body; and

simultaneously compressing and heating the coated body to permanently reduce the overall size thereof and to urge said particles into permanent electrically conducting contact with one another.

4,171,411
INSULATIVE AND CUSHIONING INTERLINER FOR GARMENTS AND THE LIKE

Herbert A. Ehrenfreund, Madison, Conn., assignor to Tuxis Corporation, Madison, Conn.

Continuation-in-part of Ser. No. 764,225, Jan. 31, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 917,847

Int. Cl.[2] C08J *9/12*; **C08L** *53/02*

U.S. Cl. 521—98 **3 Claims**

1. Insulative and cushioning interliner for garments and the

like comprising a fine closed cell foam produced from a foamed blend of approximately equal parts by weight of an ethylene/methacrylic acid copolymer based ionomer resin and a styrene-butadiene block copolymer wherein said foamed blend is expanded by a normally gaseous expanding agent comprising dichlorotetrafluoroethane.

4,171,412

SPECIFIC SORBENT HAVING D-AMINOACID MOIETY COVALENTLY BONDED TO SOLID PARTICULATE HYDROPHILIC POLYMERIC CARRIER

Jiří Čoupek, Prague; Jaroslava Turkova, Český Brod; Karel Blaha, Prague, and Olga Valentová, Prague, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Apr. 17, 1975, Ser. No. 568,776

Claims priority, application Czechoslovakia, Apr. 25, 1974, 2957/74

Int. Cl.[2] C08F *220/20*

U.S. Cl. 525—329 **2 Claims**

1. Specific sorbent, wherein D-aminoacid or a peptide containing D-aminoacid units in amount of 8–100 μmol/g is covalently bonded to a solid particulate hydrophilic polymeric carrier of a copolymer of hydroxyalkyl ester or hydroxyalkylamide of acrylic or methacrylic acid with crosslinking ethylene diacrylate or ethylene dimethacrylate comonomers.

4,171,413

ACRYLIC HYDRAZIDES

Marvis E. Hartman, Pittsburgh; Rostyslaw Dowbenko, and Thomas R. Hockswender, both of Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 636,485, Dec. 1, 1975, abandoned. This application Aug. 4, 1977, Ser. No. 821,686

Int. Cl.[2] C08F *8/30*

U.S. Cl. 525—329 **14 Claims**

1. An acrylic polymer containing hydrazide groups comprising the reaction product of:

(A) an addition polymer which does not contain an epoxy, nitrile or N-methylol group, formed by vinyl polymerization of 1 to 20 percent by weight of an alpha, beta-ethylenically unsaturated carboxylic acid and 80 to 99 percent by weight of at least one other vinyl monomer component at least a portion of which contains a functional group which is reactive with hydrazine to form hydrazide groups; the percentage by weight being based on total weight of alpha, beta-ethylenically unsaturated carboxylic acid and other vinyl monomer component, said addition polymer having at least 25 percent of its acid groups neutralized with an organic or inorganic base, said addition polymer being a solid in the absence of solvents,

(B) 5 to 40 mole percent of hydrazine or an alkyl substituted hydrazine based on total moles of monomers used in preparing said addition polymer with the proviso that the moles of hydrazine or alkyl substituted hydrazine do not exceed the moles of monomers containing functional groups reactive with the hydrazine.

4,171,414

CATALYST COMPOSITION FOR AN IMPROVED POLYMERIZATION PROCESS OF ISOOLEFINS AND MULTIOLEFINS

Joseph Wagensommer, Westfield, and Pacifico V. Manalastas, Jersey City, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 827,700, Aug. 25, 1977. This application Apr. 17, 1978, Ser. No. 897,104

Int. Cl.[2] C08F *4/52, 36/06, 36/08*

U.S. Cl. 526—185 **8 Claims**

1. A solution process for preparing copolymers of isobutylene and isoprene having about 0.1 to about 8.0 mole % unsaturation and an $\overline{Mn}$ of at least about 30,000, which consists essentially of:

(a) forming a feed of said isobutylene and said isoprene dissolved in a paraffinic hydrocarbon cosolvent;

(b) adding said feed into a reactor;

(c) forming a solution of a hydrocarbon soluble catalyst in a paraffinic hydrocarbon solvent, said catalyst being the reaction product of $RAlX_2$ and a halogen containing compound, wherein X is selected from the group consisting of chlorine, bromine and iodine and mixtures thereof, m is 1, 2 or 3, and R is the same or different alkyl or aryl radical of a straight or branched chain structure having about 1 to about 7 carbon atoms, wherein said halogen containing material is selected from the group consisting of Cl_2, Br_2, I_2, HCl, HBr and HI and mixtures thereof, a molar ratio of said halogen containing material to said $RAlX_2$ is about 0.014 to about 0.15;

(d) adding said solution of said catalyst to said reactor;

(e) polymerizing said isobutylene and said isoprene at a temperature in the range of about 0° C. to −100° C. at a pressure of from about 0 to about 100 psig to form a polymer cement; and

(f) discharging the contents from said reactor and terminating the polymerization reaction of said discharged contents.

4,171,415

POLYMERS OF UNSATURATED ESTERS OF POLYFLUOROALKYLTHIOALCOHOLS

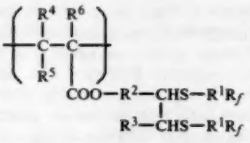
Eduard K. Kleiner, New York, and Robert E. A. Dear, Mt. Kisco, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 657,140, Feb. 11, 1976, Pat. No. 4,060,681. This application Aug. 31, 1977, Ser. No. 829,419

Int. Cl.[2] C08F *28/04*

U.S. Cl. 526—243 **7 Claims**

1. A homopolymeric oil and water repellant compound consisting essentially of repeating units of the structure:

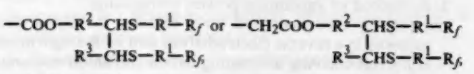


wherein

R^1, R^2 are each C_nH_{2n}, where n is 1 to 12 and may be straight chain or branched;

R^3 is hydrogen or C_nH_{2n+1}, where n is 1 to 12 and may be straight chain or branched;

R^4, R^5 and R^6 are hydrogen, methyl,



provided that at least one of R^4, R^5 and R^6 is hydrogen or methyl;

R_f is C_pF_{2p+1} or $C_pF_{2p+1}OC_qF_{2q}$, where p is 3 to 18, q is 2 to 8.

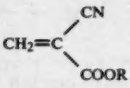
4,171,416

α-CYANOACRYLATE-TYPE ADHESIVE COMPOSITION

Akira Motegi; Eiji Isowa, and Kaoru Kimura, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1978, Ser. No. 897,882
Claims priority, application Japan, Apr. 19, 1977, 52-44129
Int. Cl.[2] C08F *4/00, 118/14, 118/16*
U.S. Cl. 526—245 11 Claims

1. An adhesive composition comprising a minimum of 80% by weight of an alpha-cyanoacrylate represented by the general formula (I)



wherein R represents a straight chain or branched chain alkyl group which may be substituted with a halogen atom or an alkoxy group, a straight chain or branched chain alkenyl group, a straight chain or branched chain alkynyl group, a cycloalkyl group, an aralkyl group or an aryl group, and about 0.1 ppm or more, based on the total weight of said adhesive composition, of at least one crown compound selected from the group consisting of macrocyclic polyethers and macrocyclic polyethers wherein nitrogen, sulphur, phosphorus or boron wholly or partially replace oxygen atoms of the macrocyclic polyether.

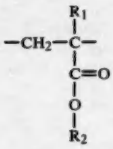
4,171,417

POLYMERS WITH IMPROVED SOLVENT HOLDOUT IN ELECTROCONDUCTIVE PAPER

Kenneth W. Dixon, Sewickley, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 30, 1978, Ser. No. 956,302
Int. Cl.[2] C08F *220/22*
U.S. Cl. 526—245 3 Claims

1. A copolymer comprising monomer units of quaternary diallyldialkyl ammonium and a monomer of the formula:



wherein,

R_1 is hydrogen or methyl;

R_2 is an alkyl group of 2 to 12 carbon atoms, that number being designated n, substituted with fluorine atoms in number equal to from n to 2n; and for the quaternary diallyldialkylammonium monomer, the alkyl groups are independently selected from alkyl groups of one to 18 carbon atoms and the counterion is an anion; and the quaternary diallyldialkylammonium monomer comprises from 70 to 99.5 weight percent of the final polymer, while the monomer of the above formula comprises from 0.5 to 30 weight percent of the final polymer.

4,171,418

CATIONIC AND AMPHOTERIC SURFACTANTS

Girish C. Barua, New Canaan, and Daniel E. Nagy, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 22, 1977, Ser. No. 853,976
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.[2] C08F *220/56, 220/58, 228/00, 220/02*
U.S. Cl. 526—287 11 Claims

1. A water-soluble vinyl addition copolymer consisting of copolymerized vinyl monomeric units of which 30 to 70 percent by weight consist of acrylamide units, at least 30 percent by weight consist of at least one nonionic vinyl monomer unit having hydrophobic properties and at least 10 percent by weight consist of vinyl monomer units having ionic properties in aqueous solution, said copolymer having surface active properties in aqueous solution.

4,171,419

CARTRIDGE FOR SECURING STAY BARS IN BORE HOLES CONTAINING A POLYISOCYANATE COMPONENT IN ONE COMPARTMENT AND A POLYOL CONTAINING TERTIARY AMINE NITROGEN IN ANOTHER COMPARTMENT

Frank Meyer, Essen; Rolf Kubens, Odenthal, and Martin Winkelmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 875,038
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705751
Int. Cl.[2] C08G *18/32*
U.S. Cl. 528—67 9 Claims

1. A two-compartment cartridge which is suitable for securing stay bars in bore holes and which is destructible by the stay bar, containing a polyisocyanate component in one compartment and a polyol component in the other compartment, wherein the polyisocyanate component used comprises an aromatic polyisocyanate or a mixture of aromatic polyisocyanates, and the polyol component used comprises a polyol containing tertiary amine nitrogen and having a molecular weight of from about 119 to 1,000 or a polyol mixture containing at least one such polyol.

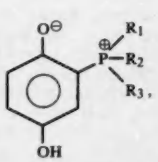
4,171,420

LATENT CATALYSTS FOR PROMOTING REACTION OF EPOXIDES WITH PHENOLS AND/OR CARBOXYLIC ACIDS

George A. Doorakian, Waltham, and Lawrence G. Duquette, Maynard, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

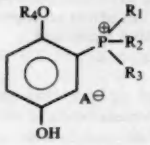
Division of Ser. No. 674,019, Apr. 5, 1976, Pat. No. 4,132,706, which is a continuation of Ser. No. 481,599, Jun. 21, 1974, abandoned. This application Sep. 26, 1978, Ser. No. 945,933
Int. Cl.[2] C08G *59/68, 59/42*
U.S. Cl. 528—89 13 Claims

1. A curable composition comprising (a) an epoxy resin bearing an average of more than one vicinal epoxy group per molecule, (b) a small but catalytic amount of a trisubstituted (2,5-dihydroxyphenyl) phosphonium hydroxide inner salt corresponding to formula I



I

wherein R_1–R_3 are hydrocarbyl or inertly-substituted hydrocarbyl radicals, each of which independently has from 1 to about 20 carbon atoms; or a hydrolyzed derivative of I corresponding to formula II



II

wherein R_1–R_3 have the aforesaid values, R_4 is hydrogen, benzyl or lower alkyl, and $A^{\ominus}$ is a compatible neutralizing anion, and (c) a carboxylic acid or anhydride of said acid.

4,171,421

THERMOPLASTIC COPOLYESTERS

Lothar Buxbaum, Lindenfels, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 27, 1977, Ser. No. 836,938

Claims priority, application Switzerland, Oct. 7, 1976, 12700/76

Int. Cl.² C08G *63/18*

U.S. Cl. 528—194 **10 Claims**

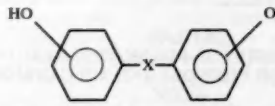
1. A linear thermoplastic copolyester, which has a relative viscosity of at least 1.3, measured on a solution of 1 gram of polyester in 100 ml of a solvent consisting of equal parts of phenol and symmetrical tetracholorethane at 30° C., which comprises the condensation product in about a 1:1 molar ratio of diacids (a) and (c) with bisphenols (b) so that the composition of the polyester comprises

in the diacid component of the polyester

(a) from 49.5 to 45 mol %, based on the total polyester, of radicals of at least one aromatic dicarboxylic acid; and

(c) from 0.5 to 5 mol %, based on the total polyester, of radicals of one or more linear or branched aliphatic dicarboxylic acid having 6 to 24 C atoms; and in the bisphenol component of the polyester

(b) 50 mol %, based on the total polyester, of radicals of at least one bisphenol of the formula I



(I)

in which the OH groups are bonded in the m-position or p-position and X is a direct bond, O, S, SO_2, alkylidene of 2 to 8 carbon atoms, dichloroethylidene, trichloroethylidene, alkylene of 1 to 2 carbon atoms, phenylmethylene, diphenylmethylene, methylphenylmethylene, or cycloalkylidene of 5 to 8 carbon atoms,

wherein the radicals (a) and (c) are attached to radicals (b) through ester linkages in a random distribution.

4,171,422

PRODUCTION OF THERMALLY STABILIZED POLYESTER

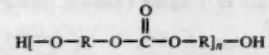
Stanley D. Lazarus, Petersburg; Kalidas Chakravarti, Richmond; Hugh H. Rowan, Chester, all of Va., and James G. Neal, Raleigh, N.C., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 11, 1978, Ser. No. 941,448

Int. Cl.² C08G *63/64, 63/68, 63/76*

U.S. Cl. 528—437 **10 Claims**

1. A high molecular weight linear polyester stabilized against thermal degradation comprising a polyester reacted with a thermally stabilizing amount of a polycarbonate corresponding to the formula



wherein R is a divalent hydrocarbon radical containing 2 to 15 carbon atoms and n is an integer between 2 and 100, in the presence of a catalytic amount of a phosphonium compound selected from the group consisting of tetra-n-alkylphosphonium acetates and tetra-n-alkylphosphonium halides, said n-alkyl radical containing 1 to 6 carbon atoms.

4,171,423

DERIVATIVES OF ESTER DIOL ALKOXYLATES AND COMPOSITIONS THEREOF

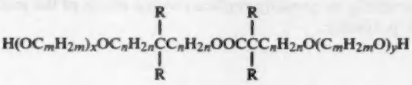
Oliver W. Smith, South Charleston; Joseph V. Koleske, Charleston, and Robert J. Knopf, Saint Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,720

Int. Cl.² C08G *63/68, 63/76*

U.S. Cl. 528—289 **28 Claims**

1. An anhydride modified ester diol alkoxylate comprising the reaction product of (A) an ester diol alkoxylate of the general formula:



wherein m is an integer having a value of from 2 to 4, n is an integer having a value of from 1 to 5, x and y are integers each having a value of from 1 to 20 and R is an alkyl group having from 1 to 8 carbon atoms; and (B) an intramolecular anhydride of a polycarboxylic acid.

12. A high solids composition comprising an anhydride modified ester diol alkoxylate as claimed in claim **1** and additionally containing from 25 to 200 weight percent thereof of a crosslinking agent.

13. A high solids composition as claimed in claim **12**, wherein said crosslinking agent is hexamethoxymethyl.

4,171,424

POLYESTERS CONTAINING UNITS DERIVED FROM METAL SALTS OF N-HYDROXYALKYLATED BRANCHED α-AMINOACIDS

Jürgen Habermeier, Pfeffingen, Switzerland, and Godwin Berner, Fürth, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 673,238, Apr. 2, 1976, Pat. No. 4,093,639. This application Mar. 16, 1978, Ser. No. 887,272

Claims priority, application Switzerland, Apr. 14, 1975, 4719/75

Int. Cl.² C08G *63/68*

U.S. Cl. 528—292 **14 Claims**

1. A copolyester, having a relative viscosity of at least 1.08 as measured on a solution of 1 gram of polymer in 100 ml of a mixture consisting of equal parts of phenol and symmetrical tetrachloroethane at 30° C., which comprises the condensation product in about a 1:1 molar ratio of diacids (a) with diols (b) and (c) so that the composition of the copolyester comprises, with all mol % values based on the total polyester,

in the diacid component of the polyester

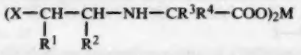
(a) 50 mol%, of radicals derived from one or more aliphatic, cycloaliphatic, aromatic or heterocyclic-aromatic dicarboxylic acid;

and in the diol component of the polyester

(b) from 47.5 to 35 mol% of radicals derived from one or more aliphatic, cycloaliphatic, cycloaliphatic-aliphatic,

aromatic, aromatic-aliphatic or heterocyclic-aliphatic diols; and

(c) from 2.5 to 15 mol% of radicals derived from one or more metal complex, of an N-hydroxylalkylated, branched alpha-aminocarboxylic acid and a divalent metal cation, of the formula



wherein

X represents hydroxyl,

R^1 represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,

R^2 represents hydrogen, and with the proviso that when R^1 is alkyl of 1 to 4 carbon atoms or phenyl, R^2 also represents alkyl of 1 to 4 carbon atoms, or

R^1 and R^2 together represent tetramethylene,

R^3 and R^4 are the same or different and each independently represents alkyl of 1 to 4 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, phenyl or benzyl, or said phenyl or said benzyl substituted by alkyl of 1 to 12 carbon atoms, or together with R^3 and R^4 represent tetramethylene or pentamethylene, and

M represents a divalent copper, zinc, cobalt or nickel cation; or

which comprises the condensation product in stoichiometric molar amounts of diacids (a), diols (c) and hydroxycarboxylic acids (d) so that the composition of the copolyester comprises, with all mol% values based on the total polyester,

(a) from 2.5 to 15 mol% of radicals derived from one or more dicarboxylic acid (a) as defined above;

(c) from 2.5 to 15 mol% of radicals derived from one or more metal complex (c) as defined above; and

(d) from 95 to 70 mol% of radicals derived from one or more aliphatic, cycloaliphatic, cycloaliphatic-aliphatic, aromatic or aromatic-aliphatic hydroxycarboxylic acid;

wherein the radicals (a), (b) and (c) or (a), (c) and (d) are attached through ester linkages in a random distribution.

4,171,425

NITROBENZENE-ACCELERATED LACTAM POLYMERIZATION

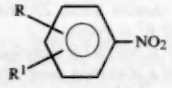
Henry Y. Lew, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 21, 1978, Ser. No. 898,605

Int. Cl.[2] C08G *69/20*

U.S. Cl. 528—315 **23 Claims**

1. A process for polymerizing a lactam to a polylactam, capable of being formed into filaments, films, or other shaped articles, which comprises polymerizing a lactam, selected from the group consisting of 2-pyrrolidone and epsilon-caprolactam, under substantially anhydrous conditions in the presence of an anionic catalyst, a polymerization activator, and a catalytically effective amount of an accelerator selected from the group consisting of nitrobenzene compounds having the formula



wherein R and R^1 are independently hydrogen or lower alkyl having 1 through 4 carbon atoms; and mixtures thereof.

4,171,426

TRIARYLMETHYLHALIDE-ACCELERATED LACTAM POLYMERIZATION

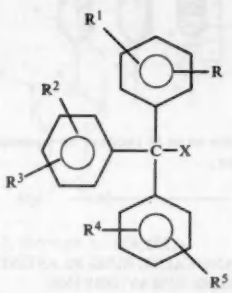
Henry Y. Lew, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 21, 1978, Ser. No. 898,603

Int. Cl.[2] C07D *231/00*

U.S. Cl. 528—312 **19 Claims**

1. A process for polymerizing a lactam to a polylactam, capable of being formed into filaments, films, or other shaped articles, which comprises polymerizing a lactam, selected from the group consisting of 2-pyrrolidone and epsilon-caprolactam, under substantially anhydrous conditions in the presence of an anionic catalyst, a polymerization activator, and a catalytically effective amount of an accelerator selected from the group consisting of triarylmethyl halides having the formula



(I)

wherein X is chloro or bromo and R, R^1, R^2, R^3, R^4 and R^5 are independently hydrogen or lower alkyl having 1 through 4 carbon atoms; and mixtures thereof.

4,171,427

PROCESS FOR CONTINUOUSLY REMOVING MONOMERS FROM AN AQUEOUS DISPERSION OF A POLYMER

Alexander Ohorodnik, Erftstadt-Liblar; Karl Kaiser, Brühl, and Rudolf Wesselmann, Erftstadt-Lechenich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 686,162, May 13, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,765

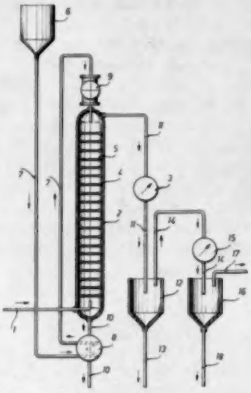
Claims priority, application Fed. Rep. of Germany, May 16, 1975, 2521780

Int. Cl.[2] C08F *6/16, 6/24*

U.S. Cl. 528—500 **10 Claims**

1. In a process for removing monomeric matter from an aqueous polymer dispersion, the polymer dispersion containing at least 50 weight % of polymerized vinyl chloride by contacting the polymer dispersion with steam, the improvement which comprises introducing the aqueous polymer dispersion in the form of dispersed particles ranging in size from about 20–500 microns into the upper portion of the column provided with sieve plates having apertures with a diameter ranging from 1–10 mm whereby the dispersion flows substantially continuously through the column and sieve plates, contacting the dispersion therein for a sojourn time of the polymer dispersion in the column of 0.3 up to 10 minutes and under a pressure of about 600 up to 1200 mm Hg with hot steam at about 100° to 150° C. flowing at a substantially constant rate and countercurrently with respect to the substantially continuously flowing dispersion whereby the polymer particles are maintained in suspension and prevented from clogging the sieve plates through which they pass, a vaporous matter mixture containing the aqueous polymer dispersion passes through the sieve plates with the counter-current flow of steam; removing the

polymer dispersion so treated from the column base portion; and condensing stagewise a vaporous matter mixture issuing at



the head of the column so as to recover an aqueous phase and the monomeric matter.

4,171,428

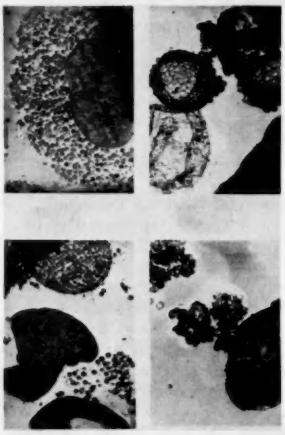
METHOD FOR MANUFACTURING PLASTISOL RESINS USING SPRAY-DRYING

Leroy B. Kuhn, Easton, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 624,341, Oct. 21, 1975, abandoned, which is a division of Ser. No. 506,131, Sep. 18, 1974, Pat. No. 4,002,702, which is a continuation-in-part of Ser. No. 403,363, Oct. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 202,456, Nov. 26, 1971, abandoned. This application Jun. 6, 1977, Ser. No. 803,708

Int. Cl.[2] C08F *6/14*

U.S. Cl. 528—502 **4 Claims**



1. A process of preparing a vinyl chloride emulsion nucleating resin which comprises spray drying an emulsion resin latex at a spray drier outlet temperature of from 32.2° C. to 54.4° C., said nucleating resin being characterized as consisting of emulsion resin particle agglomerates which disperse readily in plasticizer without being ground, said agglomerates having an average particle size of from 5 to 20 microns.

4,171,429

PYRIMIDINE TO PYRIMIDINE TRANSFORMATION PROCESS

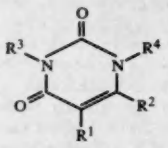
Kyoichi A. Watanabe, Port Chester; Kosaku Hirota, Mamaroneck; Chung K. Chu, Port Chester; Uri Reichman, New Rochelle, and Jack J. Fox, White Plains, all of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,353

Int. Cl.[2] C07D *239/46, 239/56, 407/04;* C07H *19/06*

U.S. Cl. 536—1 **9 Claims**

1. A process which comprises reacting an N,N-di-substituted pyrimidine of the formula

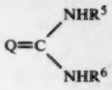


wherein

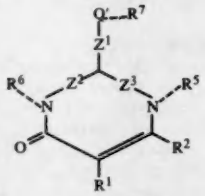
R^1 is hydrogen, halogen, lower alkyl, phenyllower alkyl, substituted phenyllower alkyl wherein the substituent is selected from the group consisting of lower alkyl, lower alkoxy or halo; phenyl, substituted phenyl, wherein the substituents are lower alkyl, lower alkoxy or halo; or a pentosyl moiety,

R^2 has the same value as R^1 and R^1 and R^2 may be the same or different provided that where R^1 and R^2 are the same, their values are other than a pentosyl moiety,

R^3 and R^4 are lower alkyl, or phenyllower alkyl, or substituted phenyllower alkyl wherein the substituents are lower alkyl, lower alkoxy, or halo, wherein the term lower qualifies a moiety containing a straight or branch chain hydrocarbon moiety of 1 to 5 carbon atoms, with a nucleophile of the formula



wherein R^5 and R^6 may be the same or different and are hydrogen or have the same meaning as R^3 above, and Q is O or S or NH, provided that where Q=NH one member of the group R^5 and R^6 is hydrogen, in the presence of a strong base to provide a pyrimidine of the formula



wherein where Q' is S or O,

Z^1 is a Q'-carbon double bond, Z^2 and Z^3 are N-carbon single bonds, and R^7 is absent,

and where when Q' is NH, R^7 is hydrogen, Z^1 is a N-carbon single bond, Z^2 is a N-carbon double bond, Z^3 is a N-carbon single bond and R^6 is absent,

or Z^3 is a N-carbon double bond, Z^2 is a N-carbon single bond and R^5 is absent.

4,171,430
SEPARATION OF SWEET COMPONENT FROM NATURAL SWEET EXTRACTS

Susumu Matsushita, and Tetsuo Ikushige, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Aug. 26, 1977, Ser. No. 828,201
Claims priority, application Japan, Sep. 16, 1976, 51-109856
Int. Cl.[2] C07H *1/08*
U.S. Cl. 536—8 7 Claims

1. A method of resolving glycoside and non-glycoside sweet components having a molecular weight ranging from 250 to 1,000 in a natural sweet extract, which comprises:

passing a solution of said natural sweet extract over a column of a porous organic gel having a pore diameter sufficient to achieve the desired resolution which is less than 1×10^4 Å and eluting the resolved glycoside and non-glycoside components from said gel with an eluant.

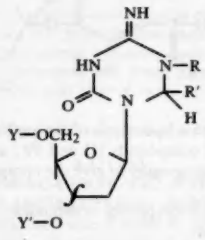
2. The method of claim 1, wherein said glycoside is stevioside, glycyrrhizin acid, or neohesperidin dihydrochalcone and said non-glycoside component is phyllodulcin or perillartine.

4,171,431
NUCLEOSIDES AND PROCESS

Harvey I. Skulnick, Oshtemo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

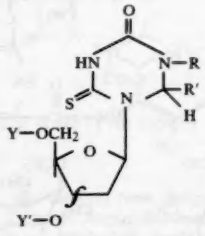
Continuation-in-part of Ser. No. 715,664, Aug. 19, 1976, abandoned. This application Jun. 1, 1977, Ser. No. 802,555
Int. Cl.[2] C07H *17/00*
U.S. Cl. 536—23 18 Claims

1. A compound of the formula:



wherein R′ is selected from the group consisting of hydrogen and lower-alkyl: Y is selected from the group consisting of hydrogen, carboxacyl of from 1 through 18 carbon atoms, and phosphono; Y′ is selected from the group consisting of carboxacyl of 1 through 18 and hydrogen; R is selected from the group consisting of hydrogen, lower-alkyl, phenyl, benzyl, cyclopropyl, lower-alkoxylower-alkyl, and lower-alkylthiolower-alkyl; and pharmaceutically acceptable salts thereof.

2. A compound of the formula:



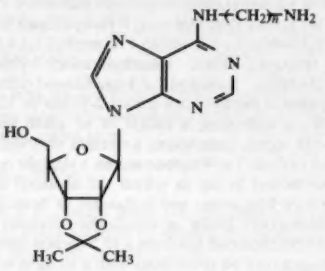
wherein R′ is selected from the group consisting of hydrogen and lower-alkyl; Y is selected from the group consisting of hydrogen, carboxacyl of from 1 through 18 carbon atoms, and phosphono; Y′ is selected from the group consisting of carboxacyl of 1 through 18 and hydrogen: R is selected from the group consisting of hydrogen, lower-alkyl, phenyl, benzyl, cyclopropyl, lower-alkoxylower-alkyl, and lower-alkylthiolower-alkyl; and pharmaceutically acceptable salts thereof.

4,171,432
FLAVIN ADENINE DINUCLEOTIDE-IODOTHYRONINE CONJUGATES

Robert J. Carrico, and Richard D. Johnson, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 22, 1978, Ser. No. 917,962
Int. Cl.[2] C07H *19/16*
U.S. Cl. 536—26 3 Claims

1. A compound of the formula:



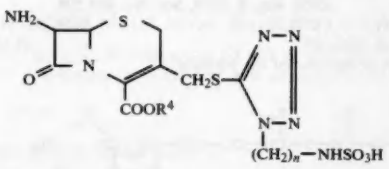
wherein n=2, through 6.

4,171,433
7-AMINO-3-(SULFAMINOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL)CEPHALOSPORIN INTERMEDIATES FOR PREPARING 7-ACYLAMINO CEPHALOSPORINS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 704,142, Jul. 12, 1976, Pat. No. 4,118,491, which is a continuation-in-part of Ser. No. 665,837, Mar. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,164, Oct. 30, 1975, abandoned. This application Jul. 14, 1978, Ser. No. 924,524
Int. Cl.[2] C07D *501/16*
U.S. Cl. 544—26 4 Claims

1. A compound of the formula:



in which:

n is two to five; and

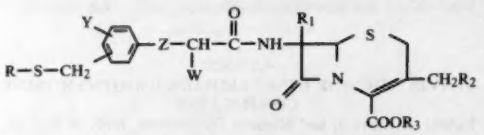
R^4 is hydrogen or a protecting ester group.

4,171,434
7-[(PYRIDYLTHIOMETHYL)PHENYL] ACETAMIDOCEPHALOSPORIN DERIVATIVES

Fortuna Haviv, Wheeling, Ill., and Abraham Patchornik, Ness Ziona, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 849,019, Nov. 7, 1977, Pat. No. 4,124,762. This application Jul. 17, 1978, Ser. No. 924,940
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—27 5 Claims

1. A compound of the formula



wherein R is 2-pyridyl, 3-pyridyl or 4-pyridyl; Y is hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, or an alkoxy group of from 1 to 4 carbon atoms; Z is a bond, oxygen or sulfur; W is hydrogen, methyl, amino, hydroxy, XO_3H, or $COOR_4$ wherein R_4 is hydrogen or 5-indanyl with the proviso that when Z is oxygen or sulfur, W is other than hydroxy; R_1 is hydrogen or methoxy; R_2 is 1,3,4-thiadiazol-2-ylthio, 5-methyl-1,3,4-thiadiazol-2-ylthio, tetrazol-5-ylthio, 1-methyltetrazol-5-ylthio, 1,3,4-oxadiazol-2-ylthio, 5-methyl-1,3,4-oxadiazol-2-ylthio, 1,3,4-triazol-2-ylthio, 5-methyl-1,3,4-triazol-2-ylthio or 1,2,3 triazol-5-ylthio; R_3 is hydrogen, a cation of an alkali metal or an alkaline earth metal, ammonium, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a straight or branched alkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 5 carbon atoms and is straight or branched, an alkanoylaminomethyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and the amine nitrogen may be substituted with a straight or branched lower alkyl group having 1 to 4 carbon atoms; an alkoxycarbonylaminomethyl group in which the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen may be substituted with a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a p-(alkanoyloxy(benzyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms; an aminoalkanoyloxy methyl group in which the alkanoyl moiety has from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di-substituted with a straight or branched lower alkyl group having from 1 to 4 carbon atoms; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,171,435
[(THIOALKYL)THIOACETYL)]CEPHALOSPORIN DERIVATIVES

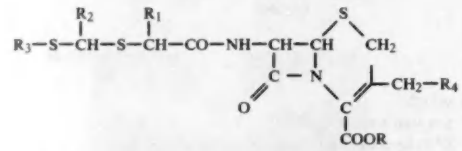
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 8, 1974, Ser. No. 495,598

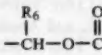
Int. Cl.[2] **C07D** *501/28, 501/32, 501/34;* **A61K** *31/545*

U.S. Cl. 544—29 **15 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenylmethyl, tri(lower alkyl)silyl,



alkali metal, alkaline earth metal, or dicyclohexylamine, triethylamine or (lower alkyl)amine salt; R_1 is hydrogen, lower alkyl, phenyl, thienyl or furyl; R_2 and R_6 each is hydrogen or lower alkyl; R_3 and R_5 each is lower alkyl, phenyl or phenyl-lower alkyl; and R_4 is hydrogen, hydroxy or lower alkanoyloxy; said lower alkyl and lower alkanoyloxy groups having up to seven carbon atoms.

4,171,436
NOVEL DEGRADATION PRODUCTS OF RUBRADIRIN AND RUBRADIRIN B AND PROCESS FOR SUCH DEGRADATION

Herman Hoeksema, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

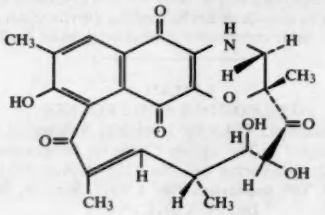
Division of Ser. No. 874,767, Feb. 6, 1978, Pat. No. 4,137,410, which is a continuation-in-part of Ser. No. 793,785, May 5, 1977, abandoned. This application Aug. 31, 1978, Ser. No. 938,686

Int. Cl.[2] **C07D** *265/28, 491/00, 309/10*

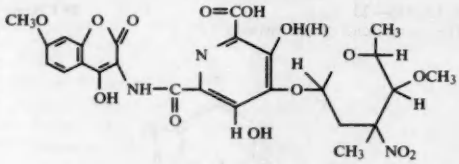
U.S. Cl. 544—99 **7 Claims**

1. A process for preparing compounds of the following structural formulas:

III



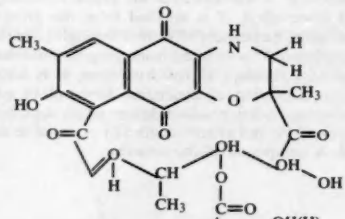
IV



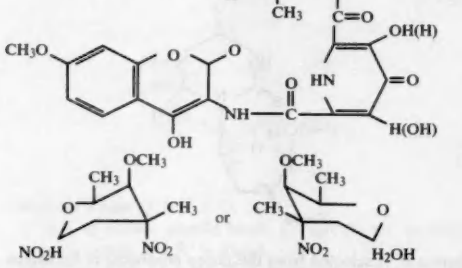
which comprises base hydrolysis of the antibiotic rubradirin to give a mixture of compounds III and IV, and resolving said mixture by chromatography to give the compounds as separate entities.

3. A process for preparing compounds of the following stru :tural formulas:

V



VI



which comprises degradation of the antibiotic rubradirin with glacial acetic acid to give a mixture from which compound V is isolated by filtration of a precipitate which forms, and subsequently isolating compound VI from the filtrate by extraction.

4,171,437
NOVEL DEGRADATION PRODUCTS OF RUBRADIRIN AND RUBRADIRIN B

Herman Hoeksema, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

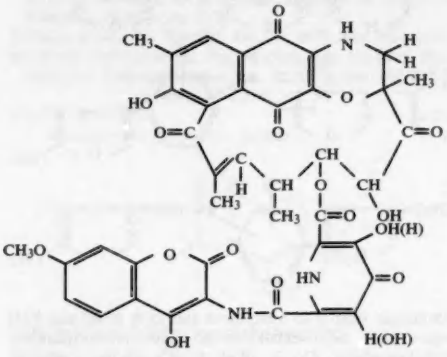
Division of Ser. No. 874,767, Feb. 6, 1978, Pat. No. 4,137,140, which is a continuation-in-part of Ser. No. 793,785, May 5, 1977, abandoned. This application Aug. 31, 1978, Ser. No. 938,603

Int. Cl.[2] **C07D** *265/28*

U.S. Cl. 544—99 **2 Claims**

1. A compound which can be shown by the following structural formula:

V



and its base salts.

2. Acylates of the compound defined in claim **1** wherein said acyl group consists of a hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive; halo-, nitro-, hydroxy-, amino-, cyano-, thiocyano-, and lower alkoxy-substituted hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive.

4,171,438
0-2-ISOCEFHEM-4-CARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS

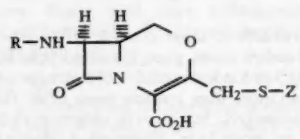
Donald E. Horning, Belleville; Leeson R. Morris, Calgary, and James L. Douglas, Montreal, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 763,454, Jan. 27, 1977, Pat. No. 4,118,566, which is a division of Ser. No. 598,461, Jul. 23, 1975, Pat. No. 4,013,648. This application Jul. 27, 1978, Ser. No. 928,499

Int. Cl.[2] **C07D** *265/34*

U.S. Cl. 544—105 **15 Claims**

1. A compound having the formula



wherein R is an acyl group of the formula

$$R^aC_nH_{2n}CO- \quad \text{(i)}$$

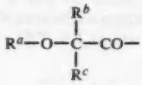
wherein R^a is (a) aryl selected from the group consisting of phenyl, 2-thienyl, 3-thienyl, furyl, 4-isoxazolyl, pyridyl, tetrazolyl, sydnone-3 or -4, imidazolyl, naphthoyl, quinoxalinyl, triazolyl, isothiazolyl, thiadiazolyl, thiazolyl, oxazolyl, oxadiazolyl, pyrazolyl, furazan, pyrazinyl, pyrimidinyl, pyridazinyl and triazinyl; (b) substituted aryl in which the aryl groups defined above under (a) are substituted by one or more chloro, bromo, iodo, fluoro, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower)alkyl, (lower)alkylamino, hydroxy, guanidino, (lower)alkylthio, carboxy, phenyl, halophenyl, trifluoromethyl, di(lower)alkylamino, sulfamyl, (lower)alkanoylamino, phenyl(lower)alkylamido, cycloalkylamino, allylamido, morpholinocarbonyl, pyrrolidinocarbonyl, piperidinocarbonyl, tetrahydropyridino, furfurylamido or N-alkyl-N-anilino radicals; (c) C_3–C_{12} cycloalkyl; (d) substituted C_3–C_{12} cycloalkyl in which the substituents are one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; (e) C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds; or (f) substituted C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 to 2 double bonds and being substituted by one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; and n is an integer from 1–4;

$$C_nH_{2n+1}CO- \quad \text{(ii)}$$

wherein n is an integer from 1–7, the alkyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;

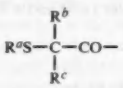
$$C_nH_{2n-1}CO- \quad \text{(iii)}$$

wherein n is an integer from 2–7, the alkenyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;



(iv)

wherein R^a is as defined above under (i) and in addition may be benzyl, C_1–C_6 alkyl or (lower)alkoxy carbonyl and R^b and R^c which may be the same or different each represent hydrogen, phenyl, benzyl, phenethyl or C_1–C_6 alkyl;



(v)

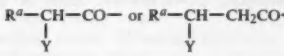
wherein R^a is as defined above under (i) and in addition may be benzyl or C_1–C_6 alkyl and R^b and R^c are as defined under (iv);

$$R^aX(CH_2)_mCO- \quad \text{(vi)}$$

wherein R^a is as defined under (i) and in addition may be benzyl; X is oxygen or sulfur; and m is an integer of 2–5;

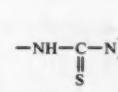
$$R^aCO- \quad \text{(vii)}$$

wherein R^a is as defined under (i);



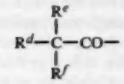
(viii)

wherein R^a is as defined under (i) and Y is hydrazino, guanidino, ureido; substituted ureido of the formula

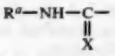


in which R^p is hydrogen or C_1–C_8 alkyl and R^q is hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, phenyl, benzoyl, C_1–C_8 alkoxy-C_1–C_8 alkyl or (carbo-C_1–C_8 alkoxy)C_1–C_8 alkyl; allo-

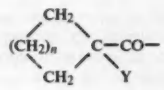
phanamido; 3-guanyl-1-ureido; 3-(2-furoyl)ureido; 3-(benzoyl-)ureido; cyano; cyanamino; azido; amino; a group obtained by reacting the amino group Y with acetone, formaldehyde, acetaldehyde; butyraldehyde, acetylacetone, methyl acetoacetate, benzaldehyde, salicylaldehyde, methyl ethyl ketone or ethyl acetoacetate; hydroxy; (lower)alkoxy; carboxy; 5-indanyloxycarbonyl; triazolyl; tetrazolyl; halogeno; formyloxy; (lower-)alkanoyloxy; sulfo; or sulfoamino;


(ix)

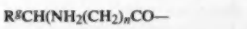
wherein R^d, R^e and R^f which may be the same or different may each represent C_1–C_6 alkyl, phenyl or phenyl substituted by one or more chloro, bromo, iodo, fluoro, trifluoromethyl, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower)alkyl, (lower)alkylamino, hydroxy, (lower)alkylthio, carboxy, di(lower)alkylamino or sulfamyl radicals;


(x)

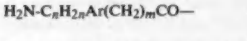
wherein R^a is as defined under (i) and in addition may be hydrogen, C_1–C_6 alkyl, halogen-substituted C_1–C_6 alkyl, phenethyl, phenoxymethyl, benzyl or R^a—CO— and X is oxygen or sulfur;


(xi)

wherein Y is as defined under (viii) and n is an integer of 1–4;


(xii)

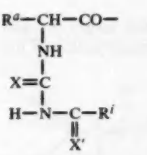
wherein n is an integer of 1–10, or



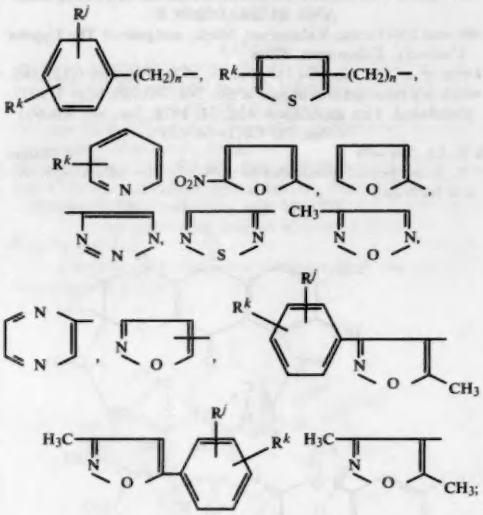
wherein m is 0 or an integer from 1–10, and n is 0, 1 or 2; R^g is hydrogen, (lower)alkyl, phenyl, benzyl or carboxy and Ar is p-phenylene or 1,4-naphthylene;

(xiii)

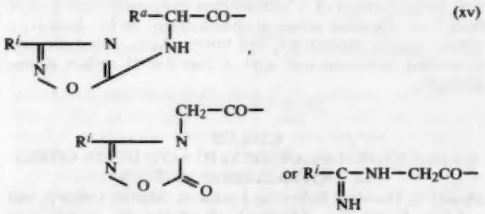
wherein R^h is 2-thienyl; 3-thienyl; α-naphthyl; 2-phenanthryl or a mono-, di- or tri-substituted phenyl group, the substituents being chloro, bromo, iodo, fluoro, amino, di(lower)-alkylamino, (lower)alkyl, (lower)alkoxy, nitro or (lower)-alkanoylamino;


(xiv)

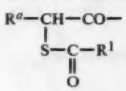
wherein R^a is as defined under (i); X is oxygen or sulfur; X′ is oxygen or imino; and R^i is (lower)alkyl, cycloalkyl having 4, 5, 6 or 7 carbon atoms, monohalo (lower)alkyl, dichloromethyl, trichloromethyl, (lower)alkenyl of 2–6 carbon atoms,



n is an integer from 0 to 3 inclusive and each of R^k and R^j is hydrogen, nitro, di(lower)alkylamino, (lower)alkanoylamino, (lower)alkanoyloxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, sulfamyl, chloro, iodo, bromo, fluoro, or trifluoromethyl;


(xv)

wherein R^a is as defined under (i) and R^i is as defined under (xiv); or


(xvi)

wherein R^a is as defined under (i) and R^1 is (lower)alkyl, cycloalkyl of 3–12 carbon atoms, phenyl, a monocyclic heterocyclic radical having 5 or 6 atoms exclusive of hydrogen which are C, S, N or O, no more than 2 atoms being other than C, or a substituted monocyclic heterocyclic radical as defined above having one or more halo, (lower)alkyl, (lower)alkoxy or phenyl substituents, Z represents a member selected from the group consisting of C_1–C_6 alkyl optionally substituted by one or more hydroxy, halo, amino, nitro, di(C_1–C_4 alkyl)amino, carboxy, sulfo or cyano substituents and a radical of the formula aryl-$(ALK)_m$- in which aryl is phenyl or naphthyl, ALK represents a straight or branched chain alkylene radical and m is 0 or an integer from 1 to 4, said radical being optionally substituted by one or more substituents selected from the group consisting of halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, cyano, carboxyl, amino, nitro, C_3–C_4 cycloalkyl, C_2–C_4 alkenyl, trifluoromethyl, hydroxy, hydroxymethyl, C_1–C_4-alkylthio, C_1–C_4 alkylamino, di(C_1–C_4 alkyl)amino, mercapto, phenyl, benzyl, alkoxyalkyl of up to 4 carbons and ——$(CH_2)_n$COOH in

which n is an integer of 1 to 4 and R'' is hydrogen or an easily cleavable ester selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl, or a pharmaceutically acceptable salt thereof.

4,171,439
ANTIBACTERIAL ANALOGS OF ISOCEPHALOSPORINS

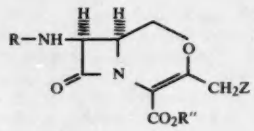
Marcel Menard; Gary M. F. Lim, both of Candiac, and Terry T. Conway, Brossard, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 759,710, Jan. 17, 1977, Pat. No. 4,112,230, which is a division of Ser. No. 567,323, Apr. 11, 1975, Pat. No. 4,011,216. This application Jun. 22, 1978, Ser. No. 918,733

Int. Cl.[2] C07D 265/34

U.S. Cl. 544—105 **21 Claims**

1. A compound having the formula



wherein R is an acyl group of the formula

(i) $R^aC_nH_{2n}CO$—

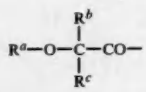
wherein R^a is (a) aryl selected from the group consisting of phenyl, 2-thienyl, 3-thienyl, furyl, 4-isoxazolyl, pyridyl, tetrazolyl, sydnone-3 or -4, imidazolyl, naphthoyl, quinoxalinyl, triazolyl, isothiazolyl, thiadiazolyl, thiazolyl, oxazolyl, oxadiazolyl, pyrazolyl, furazan, pyrazinyl, pyrimidinyl, pyridazinyl and triazinyl; (b) substituted aryl in which the aryl groups defined above under (a) are substituted by one or more chloro, bromo, iodo, fluoro, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower-)alkyl, (lower)alkylamino, hydroxy, guanidino, (lower)alkylthio, carboxy, phenyl, halophenyl, trifluoromethyl, di(-lower)alklamino, sulfamyl, (lower)alkanoylamino, phenyl(-lower)alkylamido, cycloalkylamino, allylamido, morpholinocarbonyl, pyrrolidinocarbonyl, piperidinocarbonyl, tetrahydropyridino, furfurylamido or N-alkyl-N-anilino radicals; (c) C_3–C_{12} cycloalkyl; (d) substituted C_3–C_{12} cycloalkyl in which the substituents are one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; (e) C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds; or (f) substituted C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds and being substituted by one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; and n is an integer from 1–4;

, $C_nH_{2n+1}CO$— (ii)

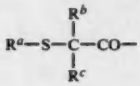
wherein n is an integer from 1–7, the alkyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;

$C_nH_{2n-1}CO$— (iii)

wherein n is an integer from 2–7, the alkenyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;

 (iv)

wherein R^a is as defined above under (i) and in addition may be benzyl, C_1–C_6 alkyl or (lower)alkoxy carbonyl and R^b and R^c which may be the same or different each represent hydrogen, phenyl, benzyl, phenethyl or C_1–C_6 alkyl;

 (v)

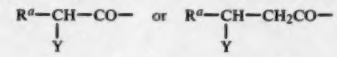
wherein R^a is as defined above under (i) and in addition may be benzyl or C_1–C_6 alkyl and R^b and R^c are as defined under (iv);

$R^aX(CH_2)_mCO$— (vi)

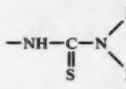
wherein R^a is as defined under (i) and in addition may be benzyl; X is oxygen or sulfur; and m is an integer of 2–5;

, R^aCO— (vii)

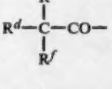
wherein R^a is as defined under (i);

 (viii)

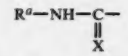
wherein R^a is as defined under (i) and Y is hydrazino, guanidino, ureido; substituted ureido of the formula



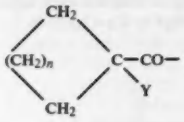
in which R^p is hydrogen or C_1–C_8 alkyl and R_q is hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, phenyl, benzoyl, C_1–C_8 alkoxy-C_1–C_8 alkyl or (carbo-C_1–C_8 alkoxy)C_1–C_8 alkyl; allophanamido; 3-guanyl-1-ureido; 3-(2-furoyl)ureido; 3-(benzoyl-)ureido; cyano; cyanamino; azido; amino; a group obtained by reacting the amino group Y with acetone, formaldehyde, acetaldehyde, butyraldehyde, acetylacetone, methyl acetoacetate, benzaldehyde, salicylaldehyde, methyl ethyl ketone or ethyl acetoacetate; hydroxy; (lower)alkoxy; carboxy; 5-indanyloxycarbonyl; triazolyl; tetrazolyl; halogeno; formyloxy; (lower-)alkanoyloxy; sulfo; or sulfoamino;

 (ix)

wherein R^d, R^e and R^f which may be the same or different may each represent C_1–C_6 alkyl, phenyl or phenyl substituted by one or more chloro, bromo, iodo, fluoro, trifluoromethyl, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower)alkyl, (lower)alkylamino, hydroxy, (lower)alkylthio, carboxy, di(lower)alkylamino or sulfamyl radicals;

 (x)

wherein R^a is as defined under (i) and in addition may be hydrogen, C_1–C_6 alkyl, halogen-substituted C_1–C_6 alkyl, phenethyl, phenoxymethyl, benzyl or R^a—CO—and X is oxygen or sulfur;



(xi)

wherein Y is as defined under (viii) and n is an integer of 1–4;

$R^gCH(NH_2(CH_2)_nCO-$ (xii)

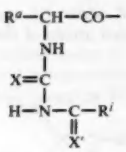
wherein n is an integer of 1–10, or

$H_2N-C_nH_{2n}Ar(CH_2)_mCO-$

wherein m is O or an integer from 1–10, and n is 0, 1 or 2; R^g is hydrogen, (lower)alkyl, phenyl, benzyl or carboxy and Ar is p-phenylene or 1,4-naphthylene;

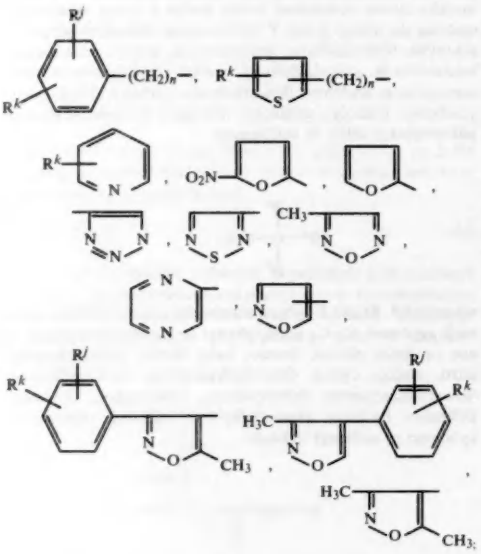
$R^kCO-CO-$ (xiii)

wherein R^k is 2-thienyl; 3-thienyl; α-naphthyl; 2-phenanthryl or a mono-, di- or tri-substituted phenyl group, the substituents being chloro, bromo, iodo, fluoro, amino, di(lower)alkylamino, (lower)alkyl, (lower)alkoxy, nitro or (lower)alkanoylamino;

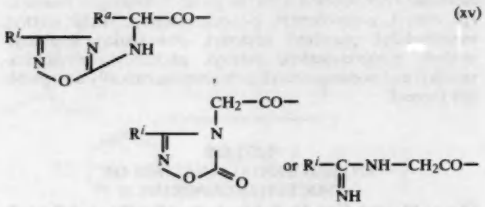


(xiv)

wherein R^a is as defined under (i); X is oxygen or sulfur; X' is oxygen or imino; and R^i is (lower)alkyl, cycloalkyl having 4, 5, 6 or 7 carbon atoms, monohalo (lower)alkyl, dichloromethyl, trichloromethyl, (lower)alkenyl of 2-6 carbon atoms,

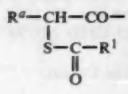


n is an integer from 0 to 3 inclusive and each of R^k and R^i is hydrogen, nitro, di(lower)alkylamino, (lower)alkanoylamino, (lower)alkanoyloxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, sulfamyl, chloro, iodo, bromo, fluoro, or trifluoromethyl;



(xv)

wherein R^a is as defined under (i) and R^i is as defined under (xiv); or



(xvi)

wherein R^a is as defined under (i) and R^1 is (lower)alkyl, cycloalkyl of 3–12 carbon atoms, phenyl, a monocyclic heterocyclic radical having 5 or 6 atoms exclusive of hydrogen which are C, S, N or O no more than 2 atoms being other than C, or a substituted monocyclic heterocyclic radical as defined above having one or more halo, (lower)alkyl, (lower)alkoxy or phenyl substituents, Z is halo or hydroxyl and R'' is hydrogen or an easily cleavable ester selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl, or a pharmaceutically acceptable salt thereof.

4,171,440

PROCESS FOR PURIFICATION OF 9-(2,6-DIHALOBENZYL)ADENINES

Ichiro Shinkai, Westfield; Leonard M. Weinstock, Belle Mead, and Roger J. Tull, Metuchen, all of N.J., assignors to Merck & Co., Inc., Rayway, N.J.

Continuation of Ser. No. 843,919, Oct. 20, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,378

Int. Cl.[2] **C07D** *473/40*

U.S. Cl. 544—277 **7 Claims**

1. A process for purifying crude 9-(2,6-dihalobenzyl)adenines, obtained by alkylating adenine, wherein the crude 9-(2,6-dihalobenzyl)adenines contain substantial amounts of 3-(2,6-dihalobenzyl)adenines which comprises transalkylating the 3-(2,6-dihalobenzyl)adenines in the presence of concentrated sulfuric acid and a carbenium ion trap selected from the group consisting of dialkyl sulfide, wherein the alkyl group contains 1 to 5 carbon atoms, diaryl sulfide, wherein the aryl groups contain 6 to 18 carbon atoms; benzene, toluene, xylene, mixed xylenes, mesitylene, alkoxybenzene wherein the alkyl group contains 1 to 3 carbon atoms; thiophene, iodobenzene, naphthalene and triphenylphosphine.

4,171,441

PREPARATION OF QUINAZOLIN-2(1H)-ONES

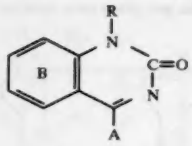
Joseph A. Smith, Fanwood, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 830,411, Sep. 6, 1977, abandoned. This application Jul. 21, 1978, Ser. No. 926,928

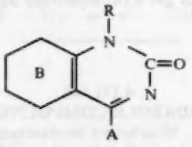
Int. Cl.[2] **C07D** *239/82*

U.S. Cl. 544—286 **18 Claims**

1. In the process for preparing a compound of the formula:



wherein R is an optionally mono, di- or tri- halo substituted hydrocarbon of 1 to 8 carbon atoms in which the halo is fluoro, chloro or bromo, A is phenyl optionally mono- or di-substituted independently by fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms or monosubstituted by trifluoromethyl or A is 2-thienyl optionally monosubstituted by fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms and Ring B is optionally mono- or di-substituted by alkyl of 1 to 3 carbon atoms, by dehydrogenating a corresponding 5,6,7,8-tetrahydro-2(1H)-quinazolinone of the formula:



wherein R, A and Ring B are as above defined, with sulfur in an inert organic solvent; the improvement comprising carrying out such dehydrogenation in the presence of an inorganic metal compound which is an oxide, hydroxide or salt and which forms a metal sulfide under the reaction conditions, the metal in said metal compound being other than magnesium, aluminum and an alkali metal.

4,171,442

PROCESS FOR THE PREPARATION OF 2,4,5-TRICHLOROPYRIMIDINE

Gunther Beck, and Helmut Heitzer, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,119

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2725888

Int. Cl.[2] C07D *239/20*

U.S. Cl. 544—334 **4 Claims**

1. Process for the preparation of 2,4,5-trichloropyrimidine, characterised in that compounds of the formula

wherein

R a radical which can be split off under the reaction conditions and

R′ an optionally substituted lower alkyl radical,

are reacted at temperatures from 0° to 50° C. with less than 7.5 mols of chlorine, in particular 3.5 to 7.0 mols of chlorine, and the reaction products are then after-heated to temperatures of 100°–150° C., in particular 110°–140° C., in the absence of chlorine.

4,171,443

10B-AZAFLUORANTHENE DERIVATIVES AND PRECURSORS THEREOF

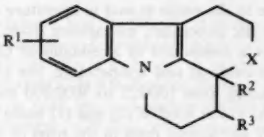
Andre A. Asselin, St. Laurent, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Filed May 8, 1978, Ser. No. 904,113

Int. Cl.[2] C07D *491/06, 495/06*

U.S. Cl. 546—66 **11 Claims**

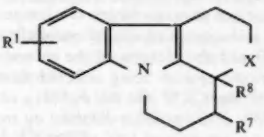
1. A compound of formula I



(I)

in which R^1 is hydrogen, lower alkyl, halo, nitro, trifluoromethyl or lower alkoxy; R^2 is a radical of formula Alk-NR^4R^5 wherein Alk is a straight or branched chain lower alkylene having one to six carbon atoms, and R^4 and R^5 each is hydrogen or lower alkyl and R^3 is hydrogen, or R^2 is lower alkyl and R^3 is a radical of formula Alk-NR^4R^5 wherein Alk, R^4 and R^5 are as defined herein; and X is oxa or thia; or a therapeutically acceptable acid addition salt thereof.

10. A compound of formula VIII



(VIII)

in which R^1 is hydrogen, lower alkyl, halo, nitro, trifluoromethyl or lower alkoxy; R^7 is hydrogen or a radical of formula CO-NR^4R^5 wherein R^4 and R^5 each is hydrogen or lower alkyl or Alk-CO-NR^4R^5 wherein Alk is a straight or branched chain lower alkylene having one to six carbon atoms and R^4 and R^5 are as defined herein; R^8 is lower alkyl or a radical of formula CO-NR^4R^5 wherein R^4 and R^5 are as defined herein or Alk-CO-NR^4R^5 wherein Alk, R^4 and R^5 are as defined herein; and X is oxa or thia; with the proviso that when R^7 is a radical of formula CO—NR^4R^5 or Alk-CO-NR^4R^5 in which Alk, R^4 and R^5 are as defined herein then R^8 is lower alkyl.

4,171,444

PROCESS FOR THE PRODUCTION OF SUBSTITUTED PYRIDINE (C)

Helmut Beschke; Heinz Friedrich, and Axel Kleeman, all of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,985

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736791

Int. Cl.[2] C07D *213/08*

U.S. Cl. 546—250 **23 Claims**

1. A process for the production of a pyridine substituted in both the 2- and 6-positions by an aromatic or heteroaromatic group comprising catalytically reacting an aromatic or heteroacromatic group substituted ketone having at least one reactive methylene group adjacent to the keto group with a saturated aliphatic aldehyde and ammonia in the gas phase at a temperature from about 250° to 550° C. in the presence of a dehydrating and dehydrogenatating catalyst which is either (1) a catalyst consisting essentially of oxygen containing compounds of Al, F, at least one of of the elements B and Si and at least one element from the second and fourth groups of the

periodic system selected from the group consisting of Mg, Ba, Zn, Sn and Zr, said catalyst having been prepared by heating in the presence of oxygen at a temperature of 600° to 800° C.:

1. aluminum, aluminum oxide or an aluminum compound convertible to the oxide at said temperature,
2. a compound of fluorine, said fluorine having been added as ammonium fluoride, ammonium hydrogen fluoride, hydrogen fluoride, fluoboric acid, fluosilicic acid, boron trifluoride, magnesium fluoborate, magnesium fluosilicate, zinc fluosilicate or barium fluosilicate,
3. boron, silicon, boric acid, silica or a compound of boron or silicon convertible to the oxide at said temperature and
4. magnesium, zinc, tin, zirconium, magnesium oxide, zinc oxide, tin oxide or a compound of zirconium or barium convertible to the oxide at said temperature, the atomic ratio of Al to F being from 1000:25 to 1000:800 and the atomic ratios of Al to the total of (3) and (4) being from 1000:5 to 1000:200, the atomic ratio of the total of boron and silicon to the other element from the second and fourth group being between 1 to 10 and 10 to 1, (2) a catalyst having been prepared by heating at 600° to 800° C. in the presence of gaseous oxygen (1) aluminum metal, aluminum oxide or a compound of aluminum convertible to the oxide upon heating with gaseous oxygen at 600° C. to 800° C., (2) ammonium fluoride, hydrogen fluoride or a fluoride of an element of the second main group of the periodic system and (3) at least one element of the second main group of the periodic system, the oxide of said element or a compound of said element convertible to the oxide in the presence of gaseous oxygen at a temperature of 600° to 800° C., said catalyst consisting essentially of the elements Al, F, O and the element of the second main group of the periodic system being selected from the group consisting of Mg, Ca, Sr and Ba, and (3) a catalyst consisting essentially of the product obtained by treating with oxygen at a temperature of 500° to 1200° C., compounds of the elements Al, F and O and at least two other elements selected from the second, fourth, fifth and sixth groups of the periodic system, said two other elements being selected from the group consisting of Mg, Ba, Zr, Sn, Ti, P, Ta, Sb, and S, the ratios of the elements being Al to F of between 1,000 to 10 and 1,000 to 800 and of Al to the elements of the second, fourth, fifth and sixth groups being between 1,000 to 5 and 1,000 to 200.

4,171,445

PROCESS FOR THE PRODUCTION OF PYRIDINE AND 3-METHYL PYRIDINE

Helmut Beschke; Heinz Friedrich, and Gerd Schreyer, all of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Siber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

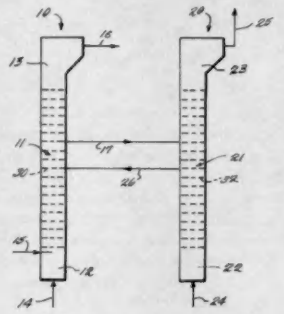
Filed Oct. 15, 1975, Ser. No. 622,488

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1974, 2449340

Int. Cl.[2] C07D *213/12*

U.S. Cl. 546—251 **16 Claims**

1. In a process for the production of pyridine and 3-methyl pyridine by reaction of acrolein with ammonia in the presence of an inert gas in the gas phase on a catalyst in a fluidized bed



in a reactor the improvement comprising introducing the acrolein and ammonia in gas form separately into the reactor.

4,171,446

INDAZOLE COMPOUNDS

Fritz Wiedemann, Weinheim-Lützelsachsen, and Wolfgang Kampe, Heddesheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

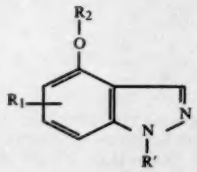
Filed Apr. 25, 1977, Ser. No. 790,646

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619165

Int. Cl.[2] C07D *231/56, 405/12*

U.S. Cl. 548—372 **14 Claims**

1. Indazole compound of the formula



wherein

R_1 is hydrogen or lower alkyl of up to 4 carbon atoms,

R' is hydrogen atom or alkanoyl of up to 7 carbon atom or benzoyl and

R_2 is benzyl or a —CH.CH(Y).CH_2. X radical, X being an acid residue selected from hydrohalic acid and sulfonic acid radicals and Y being a hydroxyl group or X and Y together representing an oxygen atom and, when R' is an alkanoyl or benzoyl radical, R_2 can also be a hydrogen atom.

4,171,447

TRI-HALO PROSTAGLANDIN INTERMEDIATES

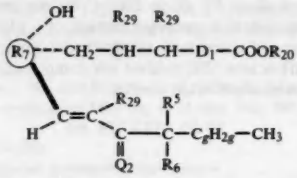
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 829,678, Sep. 2, 1977, which is a continuation-in-part of Ser. No. 755,674, Dec. 30, 1976, abandoned. This application May 10, 1978, Ser. No. 904,479

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—121 **3 Claims**

1. A compound of the formula

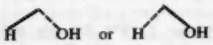


wherein D_1 is

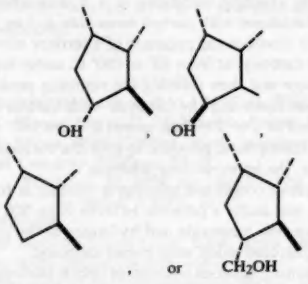
(1) $-(CH_2)_d-C(R_2)_2-$or

(2) $-CH_2-O-CH_2-Y-$

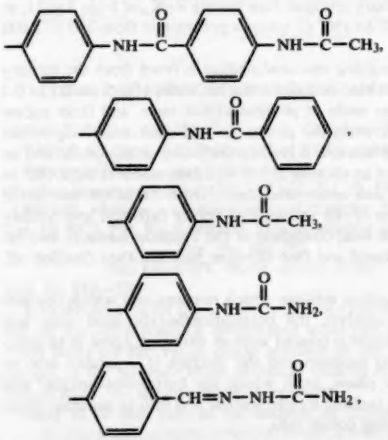
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$, $-CH_2-$ or $-(CH_2)_2$,



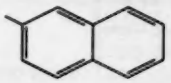
wherein R_7 is



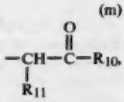
wherein R_{20} is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,



-continued



(l)



(m)

wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl,

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro

wherein R_{29} is bromo or chloro, and ~ indicates attachment in alpha or beta configuration.

4,171,448

QUATERNARY PHOSPHONIUM SALTS BEARING CARBAMATE GROUPS

Arlen W. Frank, Slidell, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 29, 1978, Ser. No. 964,853

Int. Cl.[2] **C07C** *125/04;* **C09K** *3/28*

U.S. Cl. 560—158 **4 Claims**

1. A quaternary phosphonium salt having the formula

$$[R_{4-n}P(CH_2NHCO_2R')_n]^+X^-$$

where R and R′ are radicals selected from the group consisting of alkyl, cycloalkyl and aryl, n is an integer from 1 to 4, and X is an inorganic radical.

4,171,449

ADDITION OF N,N-DICHLORO-N-ACYL COMPOUNDS TO CONJUGATED DIENES AND BIS-N-CHLOROCROTYL CARBAMATE PRODUCTS THEREFROM

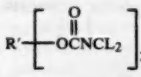
Francis A. Daniher, Ann Arbor, Mich., and Alexis A. Oswald, Mountainside, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 579,455, May 21, 1975, continuation-in-part of Ser. No. 688,308, Dec. 6, 1967, Pat. No. 3,884,963. This application Mar. 30, 1978, Ser. No. 891,853

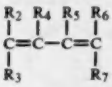
Int. Cl.[2] **C07C** *125/06;* **A01N** *9/20*

U.S. Cl. 560—161 **7 Claims**

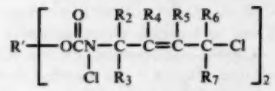
1. A selective addition-reduction process for the preparation of N-(4-chlorocrotyl-1) acyl compounds comprising adding an N,N-dichloro-acyl compound of the formula:



wherein R′ is a bivalent alkylene radical having from 2 to 12 carbon atoms to a conjugated diene of from 4 to 30 carbon atoms of the formula:

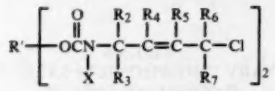


wherein R_2 and R_7 are selected from the group consisting of hydrogen, chlorine, fluorine, alkyl groups having from 1 to 30 carbon atoms and combinations thereof at a temperature of between about −80° and about 100 C. in the absence of added catalyst and at pressures between about 1 and about 10 atmospheres in the liquid phase to obtain a major amount of an adduct of the formula:



and reducing the N-chloro group of said adduct with sodium sulfite at a temperature of between about −20° to about 100° C.

4. Bis-N-chlorocrotyl carbamate compound of the formula:



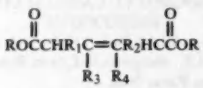
wherein R′ is a bivalent alkylene radical having from 1 to 12 carbon atoms; R_2 to R_7 are selected from the group consisting of hydrogen, chlorine, fluorine, an alkyl group having from 1 to 30 carbon atoms, and combinations thereof; and X is selected from the group consisting of chlorine and hydrogen.

4,171,450
PREPARATION OF UNSATURATED DIESTERS BY CATALYTIC OXIDATIVE CARBONYLATION OF DIOLEFINS

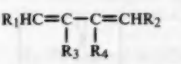
Haven S. Kesling, Jr., Drexel Hill, and Lee R. Zehner, Media, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 22, 1977, Ser. No. 808,939
Int. Cl.[2] C07C *69/52*
U.S. Cl. 560—204 **28 Claims**

1. A process for the preparation of an unsaturated diester having the formula



wherein R is an alkyl group of from 1 to 4 carbon atoms or an aralkyl group containing 6 carbon atoms in the ring and from 1 to 4 carbon atoms in the alkyl substituent and R_1, R_2, R_3 and R_4 is hydrogen, a halogen, an alkyl group of from 1 to 4 carbon atoms or an aryl group containing 6 carbon atoms in the ring, which consists essentially of reacting a diolefin having the formula



wherein R_1, R_2, R_3 and R_4 which may be the same or different are as above described, with a mixture of carbon monoxide and oxygen and at least a stoichiometric amount of a dehydrating agent selected from acetals, ketals, carboxylic ortho esters, trialkylorthoborates or dialkoxycycloalkanes, at a pressure of between about 15 psig and 5000 psig and at a temperature in the range of about 25° C. to 200° C. in the presence of an effective amount of a catalytic mixture of a platinum group metal compound or mixtures thereof and a copper (I), copper (II), iron (II) or iron (III) oxidant salt compound and recovering the desired unsaturated diester.

4,171,451
MANUFACTURE OF BUTANEDICARBOXYLIC ACID ESTERS

Rudolf Kummer, Frankenthal; Heinz-Walter Schneider, Ludwigshafen; Rolf Platz, Mannheim; Peter Magnussen, Bad Durkheim, and Franz-Josef Weiss, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1978, Ser. No. 883,216
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713195
Int. Cl.[2] C07C *67/38*
U.S. Cl. 560—204 **5 Claims**

1. In a process for the manufacture of a butanedicarboxylic acid ester, by reacting butadiene or a hydrocarbon mixture containing butadiene with carbon monoxide and an alkanol of 1 to 4 carbon atoms in the presence of a tertiary nitrogen base and a cobalt carbonyl at from 80° to 150° C. under superatmospheric pressure and then reacting the resulting pentenoic acid ester, without removing the catalyst, with carbon monoxide and an alkanol of 1 to 4 carbon atoms at from 140° to 200° C. under superatmospheric pressure to give the butanedicarboxylic acid ester, the improvement wherein

(a) an aqueous cobalt salt solution is treated, at from 50° to 200° C. and under a pressure of from 50 to 500 bars, with excess carbon monoxide and hydrogen in the presence of active charcoal laden with cobalt carbonyl,

(b) the resulting aqueous solution of cobalt carbonyl hydride is extracted with butadiene or with a hydrocarbon mixture containing butadiene and the aqueous phase is separated off,

(c) the butadiene, or butadiene-hydrocarbon mixture, containing cobalt carbonyl hydride, cobalt carbonyl and butenyl-cobalt tricarbonyl is reacted with carbon monoxide and an excess of an alkanol of 1 to 4 carbon atoms in the presence of from 0.5 to 2 moles, per mole of butadiene, of a tertiary nitrogen base having a pK_a of from 3 to 11, at from 80° to 150° C. under a pressure of from 300 to 2,000 bars,

(d) the resulting reaction mixture is freed from the tertiary nitrogen base contained therein, except for from 0.1 to 0.3 mole per mole of pentenoic acid ester, and from excess hydrocarbons, the pentenoic acid ester remaining in the reaction mixture is reacted with carbon monoxide and an excess of an alkanol of 1 to 4 carbon atoms at from 140° to 200° C. and under pressures of from 100 to 400 bars in the presence of the amounts of cobalt carbonyl and tertiary nitrogen base contained in the reaction mixture, and excess alkanol and free nitrogen base are then distilled off, and

(e) the reaction mixture which remains, and which contains cobalt catalyst, the butanedicarboxylic acid ester and by-products is treated with an oxidizing agent in an aqueous acid medium and the mixture is separated into an organic phase, from which the butanedicarboxylic acid ester is isolated by distillation, and into an aqueous phase containing cobalt salts.

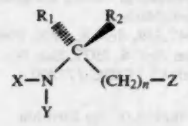
4,171,452

ANTIBACTERIALLY ACTIVE N-CHLOROAMINO ESTER DERIVATIVES OF ALKYL CARBOXYLATES

James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 632,012, Nov. 14, 1975, Pat. No. 4,036,843. This application May 16, 1977, Ser. No. 797,469
Int. Cl.[2] C07C *69/02*
U.S. Cl. 560—253 18 Claims

1. A compound having the formula:



(I)

wherein

X and Y each represent a member which may be the same or different selected from the group consisting of H and Cl with the proviso that X and Y cannot represent H simultaneously;

R_1 and R_2 each represent a member which may be the same or different selected from the group consisting of n- or branched alkyl of from 1 to 20 carbon atoms;

n represents an integer of 1 to 8; and

Z is $—OOCR_3$, wherein R_3 is n- or branched alkyl of 1 to 6 carbon atoms.

4,171,453

CARBONATION OF ALKALI METAL PHENATES

Eugene R. Moore; David C. McDonald; Joseph Willner, and Roger L. Briggs, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1978, Ser. No. 879,935
Int. Cl.[2] C07C *65/10*
U.S. Cl. 562—406 7 Claims

1. In the carbonation of a dry, alkali metal phenate in the solid phase with carbon dioxide under pressure to the alkali metal carboxylate of the corresponding phenol, the improvement wherein the carbonation is a two-step process which comprises:

(a) in the first step, carbon dioxide contacts a finely divided solid alkali metal phenate at a temperature less than about 135° C. until at least about 25 percent of the stoichiometric amount of carbon dioxide is absorbed by the phenate; and

(b) in the second step, the temperature is elevated above about 135° C. so as to effect further monocarbonation of the phenate.

4,171,454

OXIDATION PROCESS UTILIZING AMPHORA CATALYSTS

Arthur F. Miller, Cleveland; James L. Callahan, Wooster, and Wilfrid G. Shaw, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 490,429, Jul. 22, 1974, Pat. No. 3,966,639, which is a continuation-in-part of Ser. No. 271,837, Jul. 13, 1972, Pat. No. 3,848,033. This application Apr. 10, 1975, Ser. No. 566,782
Int. Cl.[2] C07C *45/04, 51/32, 57/04*
U.S. Cl. 562—546 10 Claims

1. In the process for the oxidation of propylene and isobutylene to the corresponding unsaturated aldehydes and unsaturated acids by the vapor phase reaction of the olefin with oxygen in the presence of an oxidation catalyst at an elevated temperature, the improvement comprising:

using as at least part of the catalyst an amphora catalyst having a substantially spherical shape, a void center and a single hole in the external surface of the catalyst communicating to the void center.

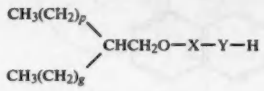
4,171,455

POLYOXYPROPYLENE POLYOXYETHYLENE ADDITION ETHER OF HIGHER BRANCHED PRIMARY SATURATED ALCOHOL

Kenichi Tomita, Tokyo; Keiichi Uehara, Yokohama; Kenji Torii; Takahiro Okuda, both of Tokyo; Hakuji Katsura, and Isao Hirano, both of Yokohama, all of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

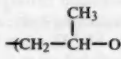
Filed Sep. 19, 1978, Ser. No. 943,727
Int. Cl.[2] C07C *43/04, 41/02*
U.S. Cl. 568—625 4 Claims

1. A polyoxypropylene polyoxyethylene addition ether of a higher branched primary saturated alcohol having the general formula (I),



(I)

wherein p represents an integer of 7 to 19, q represents an integer of p plus two, X represents



(wherein n represents an integer of 5 to 30) and Y represents $—CH_2-CH_2-O—_m$ (wherein m represents an integer of 5 to 60).

4,171,456

α,α'-BIS(2-HYDROXYETHOXY)-2,3,5,6-TETRABROMO-P-XYLENE

David R. Brackenridge, Royal Oak, Mich., and Lawrence C. Mitchell, Mt. Vernon, Ind., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 571,787, Apr. 25, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 838,725
Int. Cl.[2] C07C *43/28*
U.S. Cl. 568—663 1 Claim

1. α,α'-bis(2-hydroxyethoxy)-2,3,5,6-tetrabromo-p-xylene.

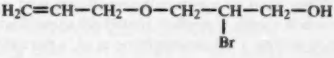
4,171,457

1-HYDROXY-2-BROMO-3-ALLYLOXYPROPANE

Seymour M. Linder, Baltimore, Md., assignor to Alcolac Inc., Baltimore, Md.

Continuation of Ser. No. 762,870, Jan. 22, 1977, abandoned, which is a division of Ser. No. 709,253, Jul. 28, 1976, Pat. No. 4,022,851. This application May 8, 1978, Ser. No. 903,587
Int. Cl.[2] C07C *41/02, 43/00*
U.S. Cl. 568—674 2 Claims

1. A polymerizable flame retardant monomer consisting essentially of 1-hydroxy-2-bromo-3-allyloxypropane of the formula:



having a purity of at least 90% and produced by the process which comprises: adding allyl glycidyl ether to a substantially equimolar amount of hydrobromic acid in acetic acid while agitating the mixture and maintaining the temperature in the range of about 25° C. to about 50° C. until the hydrobromic acid is completely reacted, vacuum stripping the thus obtained reaction mixture whereby 1-hydroxy-2-bromo-3-allyloxypropane having a purity of 90–95% is recovered as the residue.

4,171,458

MANUFACTURE OF α-NAPHTHOL

Ludwig Schuster, Limburgerhof; Eckhard Hickmann, Ludwigshafen, and Klaus Halbritter, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

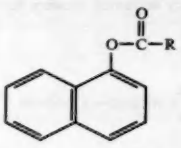
Filed Feb. 10, 1978, Ser. No. 876,759

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747956

Int. Cl.[2] C07C *39/14*

U.S. Cl. 568—735 **11 Claims**

1. A process for the manufacture of α-naphthol by hydrolyzing a carboxylic acid ester with steam in a distillation column in the presence of an acid, wherein an α-naphthyl ester of an aliphatic carboxylic acid, of the formula



I,

where R is hydrogen or an alkyl of 1 to 7 carbon atoms, which may be substituted by alkyl or alkoxy each of 1 to 4 carbon atoms, and a naphtholsulfonic acid or sulfonic acid of a naphthyl ester are passed downward through the column whilst steam is passed upward in counter-current, and the reaction is carried out at from 100° to 170° C. using from 0.9 to 1.5 moles of water per mole of α-naphthyl ester I.

4,171,459

MANUFACTURE OF α-NAPHTHOL

Ludwig Schuster, Limburgerhof, and Bernhard Seid, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

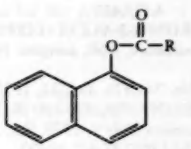
Filed Feb. 10, 1978, Ser. No. 876,758

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706682

Int. Cl.[2] C07C *39/08*

U.S. Cl. 568—735 **11 Claims**

1. A process for the manufacture of α-naphthol by hydrolyzing a carboxylic acid ester with steam in a distillation column in the presence of an acid, wherein an α-naphthyl ester of an aliph...tic carboxylic acid, of the formula



I,

where R is hydrogen or alkyl group of 1 to 7 carbon atoms, said alkyl group substituted by alkyl or alkoxy each of 1 to 4 carbon atoms, and an organic sulfonic acid selected from the group consisting of a monoalkanesulfonic acid of 1 to 6 carbon atoms, an alkanedisulfonic acid of 1 to 6 carbon atoms, a haloalkanesulfonic acid or a monoalkanesulfonic acid respective of 1 to 6 carbon atoms, a perfluorinated alkanesulfonic acid of 1 to 6 carbon atoms, a benzenesulfonic acid, a partially hydrogenated aromatic sulfonic acid, a carboxybenzenesulfonic acid, a halobenzenesulfonic acid, a hydroxybenzenesulfonic acid or a polynuclear aromatic sulfonic acid, are passed downwardly through the column while steam is passed upwardly therein counter-current flow, and the reaction is carried out at from 100° to 170° C. using from 0.9 to 1.5 moles of water per mol of said α-naphthyl ester.

4,171,460

2-DECARBOXY-2-HYDROXYMETHYL-PGF$_{1\alpha}$ ANALOGS

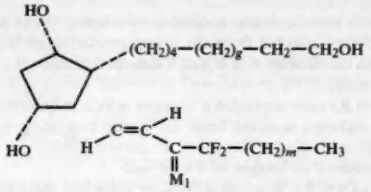
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,369, Jan. 8, 1976, Pat. No. 4,032,576. This application Apr. 6, 1977, Ser. No. 784,990

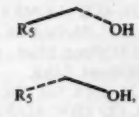
Int. Cl.[2] C07C *177/00*

U.S. Cl. 568—838 **7 Claims**

1. A prostaglandin analog of the formula



wherein M_1 is



or

wherein R_5 is hydrogen or methyl;
wherein g is one, 2, or 3; and
wherein m is one to 5, inclusive.

4,171,461

SYNTHESIS OF ETHANOL BY HOMOLOGATION OF METHANOL

Charles M. Bartish, Bethlehem, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 1, 1978, Ser. No. 939,082

Int. Cl.[2] C07C *29/00*

U.S. Cl. 568—902 **6 Claims**

1. In an homologation process for the synthesis of ethanol wherein methanol is reacted in liquid phase with carbon monoxide and hydrogen in the presence of a cobalt catalyst, the improvement which comprises employing as said cobalt catalyst a solid phase cobalt compound represented by formulas I and II below:

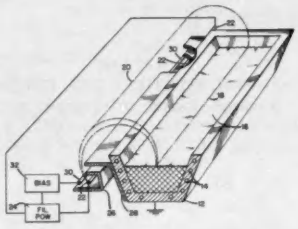
I II

$(CO_2B)_8H_3$ $(CO_2B)_{10}RhH_6$

4,171,462
LINEAR ELECTRON BEAM GUN EVAPORATOR HAVING UNIFORM ELECTRON EMISSION

George S. Janes, Lincoln; Leonard N. Litzenberger, Andover, and Donald F. Twombly, Woburn, all of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed May 19, 1977, Ser. No. 798,638
Int. Cl.[2] H01J *37/305*
U.S. Cl. 13—31 EB 15 Claims



9. A linear electron beam source with a controlled beam emissivity comprising:

an elongated generally linear electron emissive element;

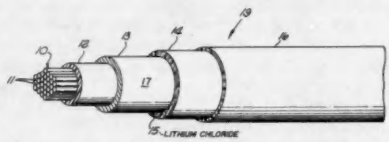
means for generating an arcuate-shaped electron beam from said element; and

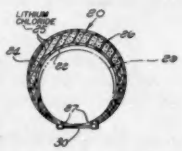
means operative in association with said electron emissive element for limiting the emission of electrons from said element in said beam independent of the local emissivity of said element.

4,171,463
RODENT PROOF CABLE

David Watkins, 9884 Amboy Ave., Arleta, Calif. 91331

Filed Feb. 17, 1978, Ser. No. 878,626
Int. Cl.[2] H01B *7/28;* A01N *17/08*
U.S. Cl. 174—120 R 8 Claims





1. An electric cable assembly comprising:

a cable;

a region around at least a portion of the circumference of said cable, said region having at least a lithium ion producing chemical disposed therein; and

means for protecting said lithium ion producing chemical from the environment.

7. A sheath apparatus for protecting an electric cable assembly from rodents, comprising:

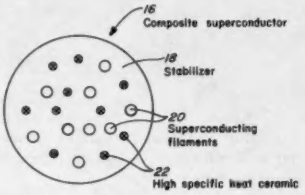
a sheath having an enclosed central cavity and having a shape adapted to fit around said electric cable assembly; and

a mixture including at least a lithium ion producing chemical disposed in said enclosed central cavity.

4,171,464
HIGH SPECIFIC HEAT SUPERCONDUCTING COMPOSITE

William A. Steyert, Jr., Los Alamos, N. Mex., assignor to The United State of America as represented by the U. S. Department of Energy, Washington, D.C.

Filed Jun. 27, 1977, Ser. No. 810,444
Int. Cl.[2] H01L *39/00;* H01V *11/00*
U.S. Cl. 174—126 S 15 Claims



1. A composite for enhancing adiabatic stability of a superconductor stabilizer comprising:

a substantially pure conductive stabilizer;

a plurality of ceramic filaments having a high specific heat due to magnetic spin specific heat anomalies at superconducting temperatures when subjected to a predetermined magnetic field, insolubly disposed within said conductive stabilizer to form said composite;

whereby said ceramic filaments substantially increase the overall specific heat of said composite thereby enhancing the adiabatic stability of said superconductor stabilizer.

4. A composite superconductor having the properties of adiabatic stability at superconducting temperatures comprising:

a substantially pure conductive stabilizer;

a plurality of superconducting filaments disposed within said conductive stabilizer;

a ceramic material having high specific heat due to magnetic spin specific heat anomalies at superconducting temperatures, insolubly mixed with said stabilizer;

whereby said ceramic material increases the entropy of said composite superconductor at superconducting temperatures to provide adiabatic stability.

8. A method of preparing a composite conductor having high adiabatic stability at superconducting temperatures comprising:

preparing a substantially pure conductive billet; forming a plurality of holes along the length of said billet;

placing multiplicity of superconducting filaments in a first predetermined number of said plurality of holes;

placing a multiplicity of ceramic filaments having a high specific heat due to magnetic spin specific heat anomalies at superconducting temperatures in a second predetermined number of said plurality of holes;

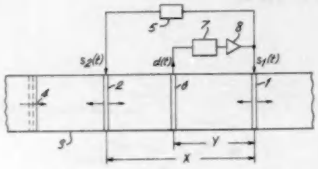
extruding said billet containing said superconducting filaments and said ceramic filaments to a size suitable for use as a superconductor such that said superconducting filaments and said ceramic filaments are insolubly mixed with said billet to form said composite;

whereby said ceramic filaments function to absorb heat and reduce temperatures produced by conduction faults in said superconducting filaments through adiabatic demagnetization.

4,171,465
ACTIVE CONTROL OF SOUND WAVES

Malcolm A. Swinbanks, Cambridge, England, assignor to National Research Development Corporation, London, England

Filed Aug. 8, 1978, Ser. No. 931,951
Int. Cl.[2] F01N 1/06
U.S. Cl. 179—1 P **6 Claims**



4. An apparatus for use in attenuating sound waves propagating along a duct through a fluid contained in the duct, the apparatus comprising:

an array of sound sources located adjacent the wall of said duct respectively at different positions along said duct, each source being capable of generating a pair of sound waves which travel through said fluid respectively in opposite directions along said duct from the position of that source;

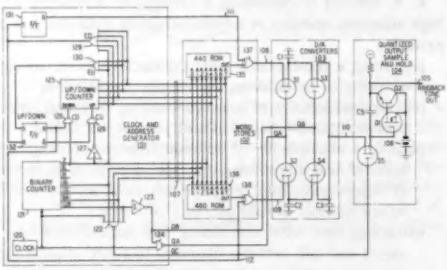
a sound detection system responsive to sound waves propagated along said duct through said fluid in a given direction and comprising at least one sound detector arranged so that each detector of said system is located at a position along said duct which is displaced in said given direction from the position of at least one of said sources; and

means for utilising the output of said sound detection system to control the operation of said array of sources to cause destructive interference to occur between an unwanted sound wave propagating in said given direction along said duct through said fluid and the resultant of the waves generated by said sources and travelling in said given direction and simultaneously to cause the resultant of the waves generated by said sources and travelling in the direction opposite to said given direction to be negligible.

4,171,466
DIGITAL WAVE GENERATOR FOR COMPOSITE TONE

Robert L. Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 16, 1977, Ser. No. 796,977
Int. Cl.[2] H04J 3/12
U.S. Cl. 179—15 BY **1 Claim**



1. A wave generator comprising a memory for storing a plurality of digit words defining magnitude levels of samples of a corresponding plurality of phases of a wave cycle and means for reading the plurality of stored digit words in a predetermined order which defines sample levels of successive phases of the wave cycle,

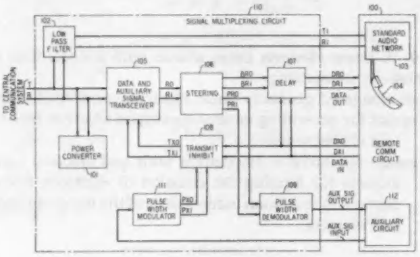
characterized in that

the reading means includes means for reading each stored digit word a plurality of times before reading the next digit word in the predetermined order whereby the rate that the digit words are read by the reading means may be increased without increasing the number of stored digital words, and further includes means for converting the read digit words to the defined wave samples wherein the converting means includes means for integrating the defined wave samples and wherein the integrating means comprises a charge ratio amplifier.

4,171,467
SIGNAL MULTIPLEXING CIRCUIT

Leonard N. Evenchik, Lorain, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 20, 1978, Ser. No. 926,421
Int. Cl.[2] H04J 3/00
U.S. Cl. 179—15 BM **7 Claims**



6. A signal multiplexing system for use between a central communication system and a remote communication circuit for concurrently transmitting voice signals, data and encoded auxiliary signals bidirectionally between said remote communication circuit and said central communication system via a communication path which comprises a single pair of wires, wherein said signal multiplexing system comprises an interface circuit for connecting said remote communication circuit to said single pair of wires and for connecting said central communication system to said single pair of wires, wherein said interface circuit comprises:

encoding means for coding outgoing said encoded auxiliary signals into pulse coded signals;

receiving means for concurrently receiving said incoming voice signals, said incoming data and said incoming encoded auxiliary signals;

isolation means for separating said voice signals from both said data and said encoded auxiliary signals;

steering means for separating both incoming and outgoing said data and said encoded auxiliary signals from each other in time;

transmitting means for concurrently transmitting outgoing said separated voice signals, data and auxiliary signals on said single pair of wires; and

decoding means for translating said incoming encoded auxiliary signals into analog signals.

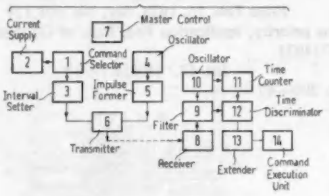
4,171,468
METHOD AND APPARATUS FOR REMOTE CONTROL

Robert Reiner, Neubiberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 853,900
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653202
Int. Cl.[2] H04J 7/00
U.S. Cl. 179—15 AW **17 Claims**

1. A remote control system comprising: a transmitter means

for command selection and a receiver means for controlling command execution; said transmitter means selectively outputting numbered individual types of dual impulse pairs to the receiver means; the individual types of dual impulse pairs differing by a time span between a start impulse and a final impulse; the receiver means including means for responding to the differing time span between the individual types of the dual impulse pairs and means for respectively assigning each of the individual types of dual impulse pairs received to one remote control command; said transmitter means including means for providing the final impulse in all the individual types of dual impulse pairs at the earliest at time



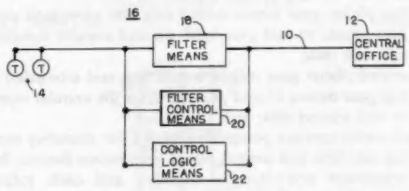
$$t_p = A + a \cdot (2^p - 1)$$

and at the latest at time

$$T_p = A + a \cdot (2^{p+1} - 1)$$

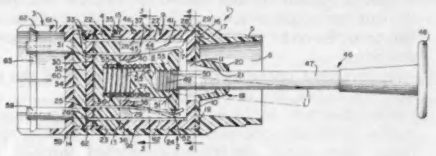
after the start impulse has appeared where A and a have constant values and p represents the number of the individual type of the dual impulse pairs.

4,171,469
ABBREVIATED DIALING SYSTEM
Fred E. Brooks, P.O. Box 2529, Orlando, Fla. 32802
Filed Apr. 27, 1978, Ser. No. 900,587
Int. Cl.[2] H04M 3/44
U.S. Cl. 179—18 BA **29 Claims**



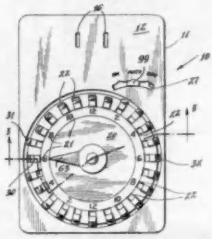
1. Apparatus colocated with a subscriber's telephone instrument in a telephone system characterized by a central office coupled to said instrument by a signal transmission link, said system including means for transmitting dial tone, status and ringing signals along said signal link at frequencies at or below 620 Hertz, said instrument including means for transmitting multifrequency dialing signals of frequencies substantially in excess of 620 Hertz along said signal link representative of a telephone number being called from said instrument, said apparatus comprising a filter coupled in said signal link for attenuating only selected multifrequency dialing signals.

4,171,470
MULTI-POLE SWITCH
William A. Gettig, Linnwood, Box 417, Millheim, Pa. 16854
Filed Jul. 24, 1978, Ser. No. 927,159
Int. Cl.[2] H01H 25/04
U.S. Cl. 200—6 A **12 Claims**



1. A multi-position switch including, a shell having a central throat in a front end, a support member within the opposite rear end of said shell, a plurality of stationary contacts disposed longitudinally within said shell, a plurality of displaceable contacts spaced adjacent and radially inwardly of said stationary contacts, said stationary and displaceable contacts having base portions fixedly disposed in said support member whereby the opposite free end portions of said radially adjacent contacts are normally maintained in a spaced apart manner, a guide member axially adjacent said support member and provided with a plurality of substantially radially extending slots throughout its length, portions of radially adjacent pairs of said stationary and displaceable contacts disposed within each one of said slots, an actuator rod disposed through said throat and having a contactor within said shell encircled by said displaceable contact free end portions whereby, radial deflection of said rod radially deflects said contactor to radially shift selected ones of said displaceable contacts into abutting engagement with said stationary contact disposed in the same said slot.

4,171,471
PROGRAMMABLE TIMER
Robert L. Boyles, Milford, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Jan. 24, 1978, Ser. No. 871,781
Int. Cl.[2] H01H 43/00
U.S. Cl. 200—38 D **16 Claims**



1. A programmable timer for selectively controlling the operation of an electrically operated device, such as a lamp, the programmable timer comprising:
(a) a housing and means mounted on the housing for connecting the programmable timer to a source of electrical power;
(b) a plurality of buttons arrayed in a circle on the housing, each of the plurality of buttons movable between and releasably positionable in a first radially inward position and a second radially outward position;
(c) a shaft rotatably mounted in the housing and centrally positioned with respect to the plurality of buttons, the shaft rotated by a motor mounted in the housing and driven by the source of electrical power;
(d) a cam bar mounted for radial sliding movement in a slot

defined through the shaft, the cam bar defining a cam notch axially disposed with respect to the shaft, the cam bar slidable to position the cam notch on and spaced apart from the axis of the shaft;

(e) a rod axially slidably mounted in the shaft and spring biased against the cam bar, the rod slidable between a first position seated in the cam bar notch and a second, axially displaced position butting against the cam bar and out of the cam bar notch, wherein sliding movement of the cam bar cams the rod out of the cam bar notch to its second position;

(f) switch means operated by axial movement of the rod between its first and second positions;

(g) means mounted on the housing for electrically connecting an electrically-operated device to the programmable timer, said means electrically-connected through the switch means to the means for connecting the programmable timer to a source of electrical power, wherein the switch means turns the electrically-operated device on and off;

(h) a bell crank rotatably mounted on a supporting member extending radially from the shaft toward the buttons, the supporting member rotating with the shaft and moving the bell crank along the circularly arrayed buttons, the bell crank including a leading edge which engages buttons in their radially inward position thereby rotating the bell crank in a first direction, the bell crank spring biased to rotate in the opposite direction when it disengages from a button in its radially inward position, the bell crank having means engaging said cam bar to move said cam bar such that the cam notch is located on the axis of the shaft when the bell crank is rotated in its first direction and to move said cam bar such that the cam notch is spaced apart from the axis of the shaft when the bell crank is rotated in its opposite direction, whereby the switch means may be operated through the rod.

4,171,472

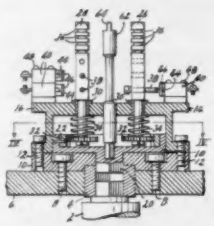
GEARED LIMIT SWITCH

Lynn T. Elliott, 60 Bendwood, Sugar Land, Tex. 77478

Filed Apr. 21, 1978, Ser. No. 898,677

Int. Cl.[2] H01H *3/16*

U.S. Cl. 200—47 **6 Claims**



1. A limit switch comprising:

a. a driver member operable to turn rotatably through less than one full revolution,

b. a switch housing mounted in a fixed position,

c. a switch-operating pole mounted for axial rotation in said switch housing,

d. a switch-operating finger mounted transversely in said pole and extending laterally therefrom,

e. an electric switch mounted on said housing and having an operating member engageable by said finger to actuate said switch at a predetermined angular position in the rotation of said pole, and

f. a driving connection between said driver member and said pole, whereby rotation of the former also causes rotation of the latter said driving connection having a step-up drive ratio such that said pole is caused to turn through a greater arc than said driver member, but still less than a complete revolution, whereby to increase the accuracy with which said switch can be caused to operate at a given angular position of said driver member, wherein said driving connection to said pole includes means whereby said driving connection may be manually disengaged, whereby said pole may be turned manually, and the driving connection again engaged, so as to provide easy angular setting of the finger relative to the switch associated therewith.

4,171,473

DEVICE FOR TERMINATING ROTARY MOVEMENT OF A DRIVEN SHAFT

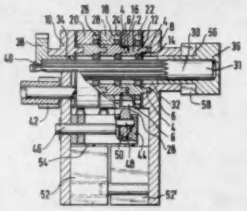
Hans Hügin, Bad Bellingen, Fed. Rep. of Germany, assignor to Bautex Adolf Stover KG, Langen, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 878,120

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714021

Int. Cl.[2] H01H *19/18*

U.S. Cl. 200—47 **7 Claims**



1. In a device for terminating the rotary movement of a driven shaft after an adjustable predetermined number of revolutions, said device comprising a first switch disk disposed coaxially adjacent a second switch disk, said first and second disks defining respectively notches on their outer circumferences, switch arm means movably mounted adjacent said disks for sensing when said notches are in a corresponding angular position, and means responsive to said sensing means for terminating the rotary movement of said driven shaft,

planet carriers for rotatably mounting said first and second disks for coaxial rotation,

said first and second disks defining respective annular openings in the central portion of said disks, said annular openings having different numbers of gear teeth thereon, drive means including an elongated central gear means extending coaxially through said annular openings of said first and second disks and adapted to be rotatably driven by said driven shaft;

a first planet gear means connecting said elongated central gear means to said gear teeth on said annular opening to said first disk;

a second planet gear means connecting said elongated central gear means to said gear teeth on the annular opening of said second disk; and

said planet carriers comprising means for rotatably mounting said first and second planet gear means thereto, being connected non-rotatably together and each rotatably supporting a said disk on the outer circumference thereof.

4,171,474

CURRENT INTERRUPTER ELECTRODE CONFIGURATION

Francis A. Holmes, Monroeville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

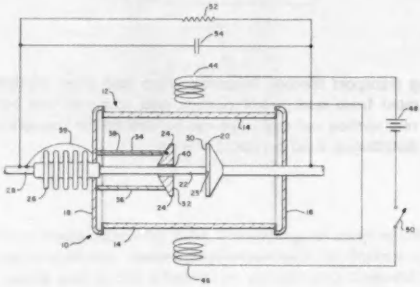
Filed May 27, 1977, Ser. No. 801,031

Int. Cl.[2] H01H *33/66*

U.S. Cl. 200—144 B **2 Claims**

1. A current interrupter for use in an electric power distribution system to protect against excessive current flow, comprising: an evacuated envelope, first, second and third electrode

members disposed within said envelope, said first and third electrode members being spaced apart and having opposed substantially flat parallel faces, said third electrode member having a central opening through said face, said second electrode member being disposed in said central opening and having a contact portion substantially smaller than said face of said first electrode member to minimize the mass of said second electrode member, said second electrode member being movable from a first position in which said second electrode member extends through said central opening and said contact portion contacts the opposed first electrode member centrally to a second position in which said first and second electrode members are spaced apart a distance at least as great as the



distance between said first and third electrode members, the separation between said first and second electrode members being at least two centimeters in said second position and the interrupter being adapted to achieve said two centimeter separation from said first position in one millisecond or less, the low mass of said second electrode member minimizing the motive force required to rapidly move said second electrode member from said first to said second positions, and means for producing lines of magnetic force between and substantially parallel to said opposed faces of said first and third electrode members to extinguish arcing between said electrode members within one-half cycle of the operating frequency of the power distribution system.

4,171,475

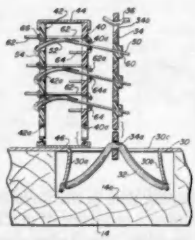
FLEXIBLE SWITCH CONTACT HAVING A PRECIOUS METAL CONTACT SURFACE

Norman B. Erickson, Des Plaines, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Filed Jun. 2, 1978, Ser. No. 911,937

Int. Cl.[2] H01H *102, 1/18*

U.S. Cl. 200—241 **6 Claims**



1. In an electrical switch mechanism of the type having support means, at least one movable contact assembly including a spring member which extends generally in a longitudinal direction and is flexible in a direction transverse to said longitudinal direction, one end of said spring member being affixed to said support means, an actuator movably mounted relative to said support means and coupled to said movable contact assembly in a manner to flex said spring member in said transverse direction upon movement of said actuator, and at least one contact member fixedly mounted upon said support means, the improvement wherein said movable contact assembly also includes a relatively stiff, smooth-surfaced movable contact member for translation in said transverse direction upon flexure of said spring member in response to the movement of said actuator, said movable contact assembly being so arranged that a portion of said movable contact member projects away from said spring member and is positioned so that said translation thereof is limited by said fixed contact member whereby electrical contact therebetween occurs as a result of said translation of said movable contact member, said actuator and said spring member have respective ranges of motion continuing after said movable contact member reaches its limit position, whereby further motion of said actuator and said spring member causes rotation of said movable contact member about said fixed contact member as a fulcrum, the surface of said fixed contact member which engages said movable contact member during said electrical contact therebetween is curved in the plane of said translation of said movable contact member whereby to permit a rolling contact motion of said movable contact member over said curved surface of said fixed contact member upon travel of said actuator past the limit position of said movable contact member.

4,171,476

RADIOGRAPHY

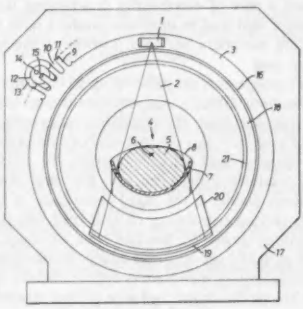
Richard M. Waltham, London, England, assignor to EMI Limited, Middlesex, England

Filed Feb. 21, 1978, Ser. No. 880,009

Claims priority, application United Kingdom, Feb. 24, 1977, 7910/77

Int. Cl.[2] G01N *21/34, 23/04*

U.S. Cl. 250—445 T **8 Claims**



1. Radiographic apparatus comprising

(a) patient locating means

(b) a source of penetrating radiation (such as X-radiation) arranged to produce a divergent spread of the radiation directed to pass through a patient located by said locating means

(c) a plurality of detectors for receiving the radiation transmitted through said patient along relatively narrow, angularly spaced beam paths, and for producing signals indicative of the received radiation

(d) scanning means for

(i) causing the radiation to assume a series of different angular positions during first periods of time, the origin of the spread remaining effectively stationary during each said first period

(ii) causing said spread to move from one of said angular positions to the next during second periods of time interleaving said first periods of time so that the spread angularly scans a slice of the patient, the slice being

disposed transverse to the axis of the angular movement and

(iii) causing said detectors to move with respect to said spread during said first intervals of time in such a way that a succession of the detectors receive radiation along each of said beam paths, and

(d) means for producing a representation of a characteristic of said slice affecting said radiation in response to the signals produced by the detectors.

4,171,477

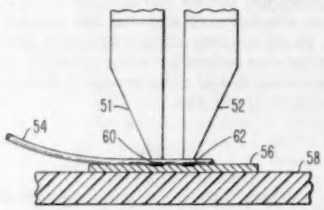
MICRO-SURFACE WELDING

Joseph Funari, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 667,811, Mar. 16, 1976, abandoned. This application Dec. 17, 1976, Ser. No. 751,919

Int. Cl.[2] **B23K** *11/00*

U.S. Cl. 219—56.21 **4 Claims**



1. The method of micro-surface bonding a metal lead not exceeding 0.005 inches in diameter to metallized circuitry on a substrate comprising the steps of:

positioning said lead over a portion of said metallized circuitry to which the lead is to be bonded;

actuating a pair of electrically conducting tip members to maintain said lead in interface contact with the tips of the bonding members and said portion of the metallized circuitry; and

passing a single current pulse of up to 0.5 amps for up to 250 milliseconds directly and serially through said bonding tip members and lead, the resistance ratio between the material of said lead and the material of said bonding tip members being at least 1 to 11 whereby the contact resistance at said interface between said lead and said bonding tip members results in the rapid generation of heat thereat to effect diffusion bonding of said lead before a significant amount of oxidation has had time to occur, whereby the bond of said lead will take place substantially only under said bonding tip members in approximately the same shape and size as the shape and size of said bonding tips.

4,171,478

CIRCULATING-AIR OVEN

Niilo Näykki, Helsinki, Finland, assignor to Kopal Oy, Helsinki, Finland

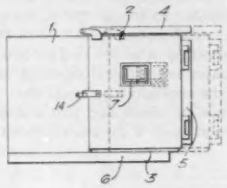
Filed Jun. 16, 1977, Ser. No. 807,157

Claims priority, application Finland, Jun. 24, 1976, 761849

Int. Cl.[2] **F27C** *15/00*

U.S. Cl. 219—400 **3 Claims**

1. A circulating-air oven comprising a power portion and a detachable oven portion, said power portion comprising a housing with an open front, said housing being permanently mounted on a pedestal and comprising standard components for blowing heat through said open front; said oven portion comprising a heat insulated housing having a front door and a completely open rear section, a removable rear wall for selectively covering the entire rear section, means for detachably positioning said oven portion on said pedestal in direct side-by-side relationship with said power portion to provide a unitary oven structure, and with the entire rear section thereof directly matingly engaging the open front of said power portion whereby the heat can enter from said power portion into the interior of said oven portion through the entire area of the rear section, the heat insulated housing being in the shape of a portable transport box, and further comprising means for facilitating transport thereof, whereby when said oven portion is separated from said power portion said rear wall can cover said rear section and said oven can be utilized for transporting and distributing food prepared therein.



4,171,479

METHOD AND DEVICE FOR THE READING OF DATA

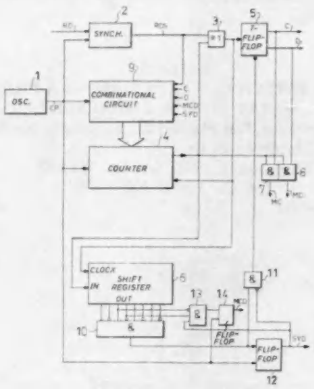
Kalman Rozsa, Järfallä, Sweden, assignor to Datasaab Aktiebolag, Järfallä, Sweden

Filed Apr. 18, 1978, Ser. No. 897,517

Claims priority, application Sweden, Apr. 19, 1977, 7704447

Int. Cl.[2] **G06K** *7/08;* **G11B** *11/9*

U.S. Cl. 235—449 **13 Claims**

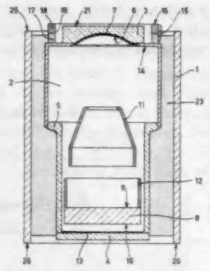


1. A method for reading data in the form of data pulses in a pulse train which contains a sequence of clock pulses which in at least a portion of the pulse train define mutually subsequent bit cells each containing at most one of the data pulses, a bistable circuit being switched to its one state by the clock pulses and switched to its other state by the data pulses, wherein the time which has elapsed after each switching of the state of said bistable circuit is measured, and wherein the state of said bistable circuit is switched if the time measured exceeds a value settable for each switching, and wherein this value is set in dependence upon the contents of at least the preceding bit cell.

4,171,480
IMAGE INTENSIFIER TUBE

Christiaan J. G. H. Wulms, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,010
Claims priority, application Netherlands, Mar. 3, 1977, 7702261
Int. Cl.[2] H01J *31/50*
U.S. Cl. 250—213 VT 6 Claims

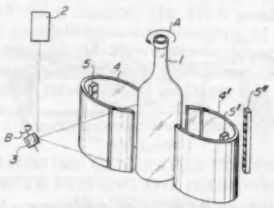


1. An image intensifier tube, comprising an inner envelope having an entrance window, a photocathode, an electron-optical system and an exit window, an upright ring supported by the inner envelope adjacent the entrance window and having an end face accurately positioned a given distance from an entrance face of the entrance window, the thermal expansion of entrance window and ring being adapted to each other for minimum displacement relative to each other, and means resiliently to mount the inner envelope of the image intensifier tube within an outer envelope.

4,171,481
APPARATUS FOR INSPECTING BOTTLES HAVING ELLIPTIC LIGHT CONVERGING MEANS

Yoshitada Mima, Tachikawa; Youji Kanno, Koganei; Nobuo Sato; Yasuhiko Hara, both of Yokohama; Yosiaki Tomita, Kodaira; Takuro Karakawa, Tokyo; Masahiro Miyamoto, Urawa, and Toshitaka Kano, Tokyo, all of Japan, assignors to Hitachi, Ltd.; Sapporo Breweries Ltd. and Hitachi Denshi Kabushiki Kaisha, all of, Japan

Filed Mar. 20, 1978, Ser. No. 887,965
Int. Cl.[2] G01N *21/32*
U.S. Cl. 250—223 B 23 Claims

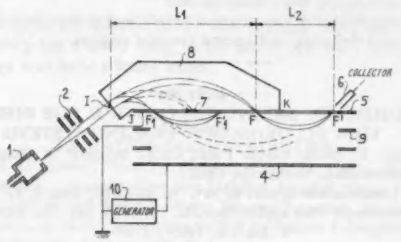


1. An apparatus for inspecting bottles having an elliptic light converging means characterized by comprising: means for applying a beam of light to a rotating bottle to be inspected, said beam of light being applied in parallel with the axis of rotation of said bottle; reflecting means having a reflective surface for reflecting and converging the light reflected by said bottle irregularly due to the presence of defect in said bottle, said reflecting means including at least one open-sided elliptic cylinder having a first and a second foci disposed such that the portion of said bottle to which said beam of light is applied is positioned on the first focus while the light reflected by said reflective surface is converged on the second focus; and at least one light receiving element disposed at said second focus.

4,171,482
MASS SPECTROMETER FOR ULTRA-RAPID SCANNING

Jean Vastel, Courbevoie, France, assignor to CAMECA, Courbevoie, France

Filed Dec. 27, 1977, Ser. No. 864,702
Claims priority, application France, Dec. 31, 1976, 76 39720
Int. Cl.[2] B01D *59/44;* H01J *39/34*
U.S. Cl. 250—296 4 Claims



1. Mass spectrometer comprising: magnetic sector means for focussing ion species onto a focal plane, electrostatic deviator means having parallel electrodes, electrical means supplying a variable bias voltage across said electrodes, and collector means arranged for selectively receiving one of said ion species emerging from said electrostatic deviator means; said ion species forming focussed beams reaching along a line of said focal plane, the angle of incidence of said beams being substantially equal to 45°; one of said electrodes being provided with an elongated slit extending along said line for transmitting said focussed beams; said collector means being arranged on said line near one end of said elongated slit.

4,171,483
DEVICE FOR X-RAY DIAGNOSIS, INCLUDING EDGE SHADOW-FREE COMPRESSION DEVICE

Johann Finkenzeller, Tennenlohe, and Jakob Derfuss, Dornitz, both of Fed. Rep. of Germany, assignors to Siemens AG, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 60,275, Aug. 3, 1970, abandoned. This application Feb. 5, 1973, Ser. No. 329,322
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1969, 1942491
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—321 3 Claims

1. A device for X-ray diagnosis, comprising:
an X-ray tube;
an image layer carrier;
a compression device for compressing a portion of the patient to be examined fixed to a side of the image layer

carrier directed toward said tube, said compression device comprising exclusively two flat, superimposed, interconnected layers of low X-ray absorption material extending over the entire illuminable surface of said image layer carrier, so that the borders of the layers are not X-rayed, one of said layers being directed toward said tube and being fabricated from an elastically extensible material, said layers defining therebetween an inflatable central circular section, and a narrow tube-like lead section extending from an edge of the two layers to said central circular section, said compression device in the area of said inflatable circular section and in the area laterally adjacent to said inflatable circular section being non-enclosed to permit the patient to be X-rayed without producing edge shadows; and

a regulatable device coupled to said lead section for inflating and deflating said central circular section.

4,171,484

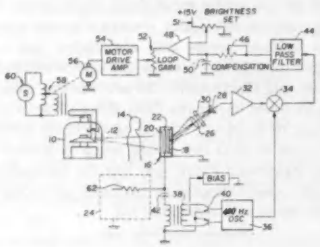
AUTOMATIC BRIGHTNESS CONTROL FOR DIRECT VIEW FLUOROSCOPIC IMAGING SYSTEMS

Robert P. Hunt, Menlo Park, Calif., assignor to Diagnostic Information, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 821,618, Aug. 3, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,404

Int. Cl.[2] H05G *1/36*

U.S. Cl. 250—355 **9 Claims**



1. Automatic brightness control apparatus for use with a variable intensity X-ray generator and an X-ray image intensifier tube of the type having a high voltage bias supply and an output phosphor display screen, the brightness control apparatus comprising

oscillator means for introducing a periodic variation in the bias supply voltage to the image intensifier tube to thereby produce a corresponding periodic brightness variation in the light output of the output display screen,

photo-optic sensor means for sensing the light output of the display screen and for producing an output signal representative of variations in the intensity of such light output,

means for phase detecting the periodically varying component of the photo-optic sensor means output signal due to the oscillator means and for thereby producing an X-ray generator intensity control signal.

4,171,485

APPARATUS FOR ANALYZING THE SPECTRAL DATA IN AN ELEMENTAL ANALYZER MEASURING GAMMA RAYS ARISING FROM NEUTRON CAPTURE IN BULK SUBSTANCES

J. Howard Marshall, Pasadena, Calif., assignor to MDH Industries, Inc., Monrovia, Calif.

Filed Sep. 22, 1977, Ser. No. 835,807

Int. Cl.[2] G01N *23/00*; G01V *5/00*

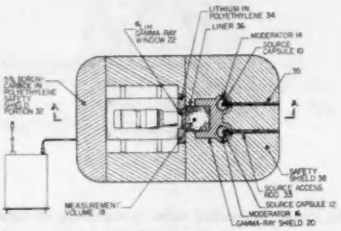
U.S. Cl. 250—359 **21 Claims**

1. An improved apparatus for the on-line analysis of the composition of a bulk substance, wherein said analysis includes the production and capture of neutrons and the detection of the resulting capture gamma rays, said apparatus comprising, in combination:

(a) means for containing the bulk substance to be analyzed;

(b) neutron-producing means for providing neutrons which generate gamma rays by neutron-capture reactions with the nuclei in the bulk substance being analyzed, the neutron-producing means being operably associated with the means for containing the bulk substance;

(c) means for gamma-ray analysis operably associated with the neutron-producing means and the means for containing the bulk substance being analyzed, the means for gamma-ray analysis providing for the digital measurement of the energy spectrum of the capture gamma rays;



(d) computing means operably associated with the means for gamma-ray analysis, the computing means generating at least one weighted sum of the numbers of events found in specific portions of the energy spectrum of the capture gamma rays, with weighting factors being chosen to enhance the accuracy in the measurement of at least one element in the presence of varying concentrations of other elements; and

(e) data-outputting means operably associated with the computing means for converting the weighted sum into an indication of the concentration of the measured element;

whereby the statistical and systematic errors in the concentration measurement are minimized in an optimal fashion.

4,171,486

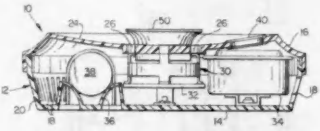
IONIZATION SMOKE DETECTOR WITH CONTROLLED SENSITIVITY

John Dobrzanski, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 31, 1977, Ser. No. 829,352

Int. Cl.[2] G01T *1/18*

U.S. Cl. 250—381 **8 Claims**



1. An ionization smoke detector comprising: a housing having a wall enclosing the housing interior and defining a plurality of openings though which smoke and other particulate material can pass between the interior and exterior of the housing, the openings being arcuate in shape and arranged in a circle in the wall of the housing; and a ventilated ionization chamber mounted within the housing interior and positioned adjacent the openings defined by the housing wall, the chamber having an interior electrode, an exterior electrode defining a ventilated chamber space and an ionizing source for ionizing air within the chamber and allowing an ionization current to flow between the electrodes when a voltage differential is applied across the electrodes, the exterior electrode being a

cylindrical shell mounted within the housing coaxially of the circle of openings through the wall of the housing and having a cylindrical sidewall and a circular end supported by the sidewall adjacent the arcuate openings of the housing, the sidewall and circular end cooperating to define arcuate slots registering with the arcuate openings of the housing to receive substantially all of the smoke and particulate matter passing inwardly through the openings.

4,171,487

X-RAY DIAGNOSTIC GENERATOR IN WHICH THE X-RAY TUBE VOLTAGE IS REGULATED VIA THE X-RAY TUBE CURRENT

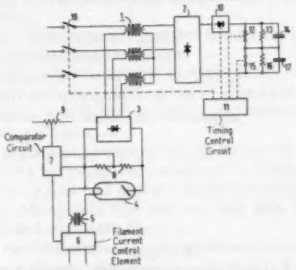
Heribert Amtmann, Buckenhof; Hans Ebersberger; Guenther Eckardt, both of Nuremberg, and Hans-Joachim Greiner, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengeselleschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,168

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733249

Int. Cl.[2] H05G *1/12, 1/32, 1/34*

U.S. Cl. 250—408 **5 Claims**



1. An X-ray diagnostic generator exhibiting a fixed or switchable no-load output voltage of the high voltage transformer, and comprising a control circuit for the X-ray tube voltage, which contains a comparator member for comparing the actual value of the X-ray tube voltage with a nominal value, as well as a control element for the heating current of the X-ray tube, said control element being controlled by the output signal of the comparator member, for the purpose of effecting a conformity of the actual value of the X-ray tube voltage with the nominal value, characterized in that, in order to adjust the X-ray tube power, there is present at least one resistance (**13, 16**), capable of being connected into the circuit of the X-ray tube (**4**) by means of a switch (**12, 15**), with which resistance (**13, 16**) a capacitor (**14, 17**) is parallel-connected, and that the parallel-connection consisting of the resistance (**13, 16**) and capacitor (**14, 17**) is dimensioned such that its time constant is approximately equal to the time constants of the control circuit (**6** through **9**) for the X-ray tube voltage.

4,171,488

X-RAY DIAGNOSIS GENERATOR COMPRISING AN INVERTER FEEDING THE HIGH VOLTAGE TRANSFORMER

Werner Kuehnel, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

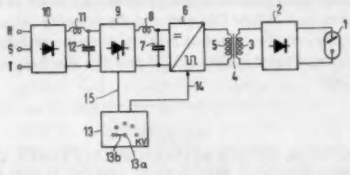
Filed Jun. 14, 1978, Ser. No. 915,367

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728563

Int. Cl.[2] H05G *1/12*

U.S. Cl. 250—421 **4 Claims**

1. An x-ray diagnosis generator comprising an x-ray tube connected to the output of a high voltage transformer, an inverter feeding the high voltage transformer, a dc voltage source connected to the input of said inverter, and means for adjusting the x-ray tube voltage, characterized in that a control device (**13**) for the inverter frequency is provided which is constructed such that the frequency is adjustable, in dependence upon the selected x-ray tube voltage, such that said frequency has a lower value to the extent that the x-ray tube voltage is to have a lower value.



4,171,489

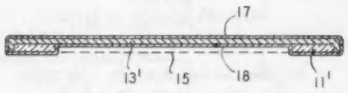
RADIATION MASK STRUCTURE

Arthur C. Adams, Berkeley Heights; Cesar D. Capio, Fords; Hyman J. Levinstein, Berkeley Heights; Ashok K. Sinha, New Providence, and David N. Wang, Warren Township, Somerset County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 13, 1978, Ser. No. 941,776

Int. Cl.[2] G21F *3/02*

U.S. Cl. 250—510 **18 Claims**



1. A radiation window arrangement comprising a tensile film of boron nitride, said film being bonded to a structurally stable support frame.

4,171,490

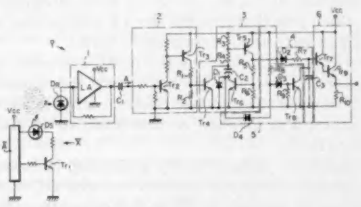
PHOTOELECTRIC SMOKE DETECTOR

Kuniharu Tatetsuki, Sakai; Tohru Hanahara, Hirakata; Takeshi Nakano, Ibaraki, and Kazushige Morisue, Owariasahi, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 27, 1977, Ser. No. 846,135

Int. Cl.[2] G01N *21/28*

U.S. Cl. 250—564 **9 Claims**



1. In a photoelectric smoke detector wherein light emitted from a light source driven by a light emitting pulse circuit and scattered by smoke particles is received by a light receiving element and variations in electric current output of said light receiving element due to variations in received amount of light at said light receiving element are detected by a switching circuit, a detection signal processing circuit for such photoelectric smoke detector comprising a one-shot pulse generating circuit which is turned ON upon actuation of the light receiv-

ing element to generate one output pulse, a charging circuit for charging a condenser with the output signal of said one-shot pulse generating circuit, and a discharging circuit for discharging the charge of said condenser, the arrangement being such that, when said one-shot pulse generating circuit is ON, said charging circuit will be ON and said discharging circuit will be OFF and, when the one-shot pulse generating circuit is OFF, the charging circuit will be OFF and the discharging circuit will be ON.

4,171,491

PLANT FOR GENERATING AND ACCUMULATING ELECTRIC ENERGY WITH THE AID OF WIND POWER OR SOLAR ENERGY

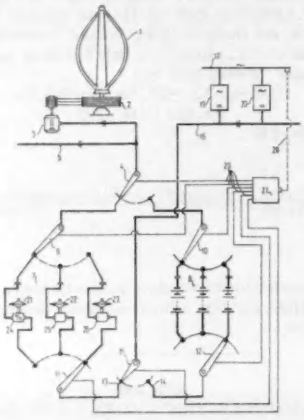
Frederik H. Theyse, Bensberg-Herkenrath, Fed. Rep. of Germany, assignor to Stichting Energieonderzoek Centrum Nederland, The Hague, Netherlands

Filed Dec. 10, 1976, Ser. No. 749,269

Claims priority, application Netherlands, Dec. 18, 1975, 7514747

Int. Cl.[2] H02K *7/02*

U.S. Cl. 290—1 R **4 Claims**



1. A plant, connected to at least one electric machine coupled to an energy converter, for storing energy that can be extracted transitorily comprising:

a plurality of reversible brushless DC motors capable of operation in a DC generator mode;

a plurality of flywheels respectively mechanically coupled to said DC motors to collectively form a flywheel battery in which temporary excess electric energy may be accumulated and stored in mechanical form;

means, including at least one DC-to-AC converter, switchably connected to said flywheel battery, for converting said mechanically stored excess electric energy to an AC electric form and adapted for connection to an AC power network;

an accumulator battery having a plurality of battery units switchably connected to said at least one DC-to-AC converter; said at least one DC-to-AC converter including at least one variable input voltage inverted rectifier;

first switch means for alternatively electrically connecting the inputs of said accumulator battery and said flywheel battery to said electric machine;

second switch means for alternatively electrically connecting the outputs of said accumulator battery and said flywheel battery to said at least one DC-to-AC converter;

third switch means for alternatively connecting the inputs of said DC motors to said electric machine when said flywheel battery is connected to said electric machine in order to distribute the energy to be stored over said flywheel battery flywheels;

fourth switch means for alternatively connecting the inputs of said accumulator battery units to said electric machine when said accumulator battery is connected to said electric machine, in order to distribute the energy to be stored over said accumulator battery units;

fifth switch means for connecting the outputs of said DC motors to said at least one DC-to-AC converter when said flywheel battery is connected to said DC-to-AC converter, in order to alternatively extract said stored energy from said flywheels;

sixth switch means for connecting the outputs of said accumulator battery units to said at least one DC-to-AC converter when said accumulator battery is connected to said DC-to-AC converter, in order to alternatively extract said stored energy from said accumulator battery units; and

an automatic regulator means, including a measuring line and responsive to the mains voltage in said AC power network, for controlling said first, second, third, fourth, fifth and sixth switch means so as to maintain said mains voltage at a substantially constant level.

4,171,492

TEMPERATURE COMPENSATED ZENER DIODE ARRANGEMENT

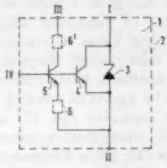
Rolf D. Burth, Emmendingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,445

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2645182

Int. Cl.[2] H03K *3/26*

U.S. Cl. 307—310 **9 Claims**



1. A temperature compensated actual zener diode arrangement in the form of a semiconductor integrated circuit comprising:

a first external terminal connected to a said zener diode,

a second external terminal connected to said zener diode,

a first transistor structure having its collected-emitter path coupled between said first and second external terminals and formed within said body of semiconductor material;

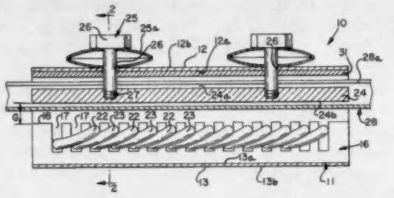
a second transistor structure formed within said body having its emitter collector path coupled between said second external terminal and a third external terminal; and

at least one dissipative structure coupled in series with the emitter-collector path of said second transistor structure between said second and third external terminals, said first and seconnd transistor structure having bases each coupled to a fourth external terminal.

4,171,493
INTEGRAL BRAKING SYSTEM FOR LINEAR INDUCTION MOTOR

Claude M. Brimer, Bryan, Ohio, and Joe W. Von Brimer, deceased, late of Las Vegas, Nev. (by Claude M. Brimer, executor), assignors to Linear International Corporation, Rancho La Costa, Calif.

Filed Oct. 31, 1977, Ser. No. 846,888
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—13 **8 Claims**

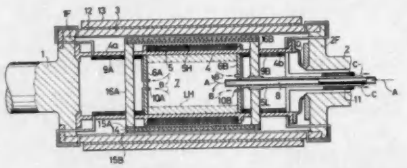


1. In a linear induction motor comprising:
a rigid frame,
a stationary ferromagnetic member fixedly mounted on said frame and insulated therefrom;
a first movable ferromagnetic member including means for resiliently mounting same on said frame so as to be biased thereagainst and further defining a gap between said ferromagnetic members;
at least a portion of an electric circuit associated with at least one of said ferromagnetic members for producing a magnetic flux across said gap therebetween which is capable of overcoming said bias and moving said first member toward said stationary member;
a second movable non-magnetic member being elongate and defining a channel-shape cross-section, one portion of said second member being disposed in said gap and another portion thereof being disposed between said first movable member and said frame; and
the collapse of said magnetic flux across said gap causing said biased first movable member to bind said second movable member between said first movable member and said frame.

4,171,494
ELECTRIC ROTARY MACHINE HAVING SUPERCONDUCTING ROTOR

Kiyoshi Yamaguchi, Hitachi; Naoki Maki, Naka, and Takanobu Mori, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 2, 1977, Ser. No. 821,233
Claims priority, application Japan, Aug. 11, 1976, 51-95600
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—52 **7 Claims**

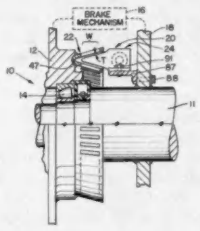


1. An electric rotary machine having a superconducting rotor, the electric rotary machine comprising a driving shaft adapted to be connected to a prime mover and having a flange, a hollow shaft confronting said driving shaft at a predetermined gap therebetween and having a flange confronting said flange of said driving shaft, a torque tube bridging the gap between said flanges, a field winding supported on an outer peripheral surface of said torque tube, a non-magnetic holding sleeve adapted for holding an entire peripheral surface of said field winding, a coolant pool formed at an inside of said torque tube, a coolant supply pipe for supplying the coolant to said coolant pool through said hollow shaft, a cylindrical inner shielding member disposed at the outside of said field winding and supported by said torque tube, non-magnetic reinforcing bodies closely fitted to inner and outer peripheral surfaces of said cylindrical inner shielding member, a cylindrical rotor constructing member provided at the outside of said inner shielding member and connected between said flanges, an outer shielding member closely fitted around said rotor constructing member, a non-magnetic reinforcing body fitted closely around said outer shielding member, cooling ducts extending over both ends of said torque tube and said rotor constructing member, a coolant discharge pipe for collecting said coolant from said ducts through said hollow shaft, and a power lead passing through said hollow shaft for supplying said field winding with electric power.

4,171,495
WHEEL SPEED SENSOR

Joseph H. McNinch, Jr., Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 20, 1978, Ser. No. 888,010
Int. Cl.[2] H02K *21/38*
U.S. Cl. 310—155 **16 Claims**



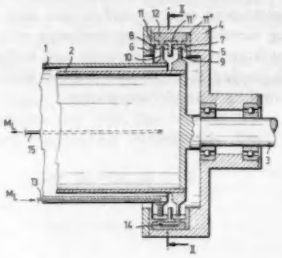
1. In a rotation indication system for generating signals in response to the rotation of a body, said indication system including an annular rotor mounted for rotation, said rotor having a plurality of surface interruptions circumferentially arranged thereon, and sensing means mounted near said rotor but fixed against rotation with said rotor, said sensing means including a sensing portion opposable across an air gap to said surface interruptions and an output portion responsive to rotation of said surface interruptions past said sensing portion for producing an electrical output signal representing the rotation of said rotor, comprising the improvement wherein said rotor and said sensing portion have complimentary substantially V-shaped cross sections in an axial plane of said rotor, the convex one of said V-shaped cross sections extending into and being spaced from the concave one of said V-shaped cross sections to define said air gap therebetween, said air gap being of correspondingly V-shaped cross section having two converging legs, the rotor having convergent V-defining surfaces which face corresponding ones of convergent V-defining surfaces on said sensing portion across corresponding legs of said V-shaped air gap.

4,171,496

APPARATUS FOR TRANSFERRING ELECTRICAL CURRENT BETWEEN TWO ELECTRICAL CONDUCTORS WHICH CAN BE BROUGHT INTO A MOVEMENT OF ROTATION IN RELATION TO EACH OTHER AROUND A COMMON AXIS

Jarl-Thure Eriksson, Jätterösvägen 3 B 19, 00340 Helsinki 34, Finland

Filed Mar. 21, 1977, Ser. No. 779,660
Claims priority, application Finland, Mar. 25, 1976, 760817
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—219 **8 Claims**



1. In an apparatus for transferring electrical current between two relatively movable conductors, the improvement wherein:

(a) the two conductors are disposed for relative rotation about a horizontal common axis, at least one of the conductors having an axle coaxial with said common axis for rotatably driving said one conductor, each conductor having an annular contact flange extending radially outwardly therefrom with respect to said common axis; and

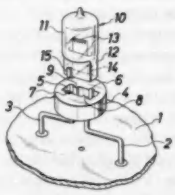
(b) an auxiliary rotor is arranged for rotating about an axis coaxial with said common axis, said rotor being rotatably supported by bearing means carried on said axle of said one conductor, and having an inner periphery including two annular grooves in which respective rings of liquid metal are held by centrifugal force during rotation of said rotor and are electrically interconnected by an electrically conductive unit in said rotor, each annular groove encircling and receiving therewithin a respective annular contact flange of said two conductors in contacting relationship with its ring of liquid metal, thereby providing a path for transfer of electrical current between said two conductors by way of their respective contact flanges and said electrically interconnected rings of liquid metal with which said flanges are in contacting relationship.

4,171,497

SEALED BEAM LAMP FOR AUTOMOBILE

Arihiro Shinoda, Hatano, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1978, Ser. No. 923,496
Claims priority, application Japan, Jul. 18, 1977, 52-94441[U]
Int. Cl.[2] H01K *1/46;* **H01R** *33/06*
U.S. Cl. 313—113 **5 Claims**



1. A sealed beam lamp comprising:

a sealed halogen bulb **(10)** having a pinch-sealed portion **(12)**, a filament **(13)** therein and at least two lead-out contact members **(14,15)** coupled to said filament and extending out of said pinch-sealed portion **(12)**;

a reflector **(1)**;

electrically conducting supports **(2,3)** mounted on said reflector;

a bracket **(4)** mounted on said supports and having a socket recess **(5)**, said socket recess having opposed walls;

terminals **(6,7)** provided in said socket recess on said opposed walls and electrically connected with said supports;

said pinch-sealed portion **(12)** of the halogen bulb being adjustably insertable in said socket recess **(5)** with said contact members **(14,15)** abuttingly contacting respective terminals **(6,7)**;

said opposed walls having protrusions formed at respective positions opposite to and facing respective terminals to thereby provide a spacing between a portion of said opposed walls of said recess and a portion of said pinch-sealed portion of said bulb which is received in said recess; and

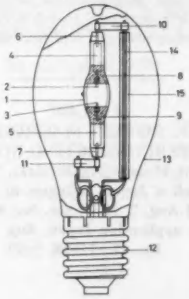
means **(16)** for fixing said pinch-sealed portion in said recess.

4,171,498

HIGH PRESSURE ELECTRIC DISCHARGE LAMP CONTAINING METAL HALIDES

Dietrich Fromm, Warngau; Jürgen Seehawer, Munich; Wolf-Jürgen Wagner, Munich, and Erich Winzerling, Munich, all of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Nov. 25, 1977, Ser. No. 854,765
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1976, 2655167
Int. Cl.[2] H01S *61/18*
U.S. Cl. 313—229 **15 Claims**



1. A high pressure electric discharge lamp having, a color temperature below about 3800° K. and good color rendering, comprising

a transparent arc tube having high strength at elevated temperatures and having an isothermal shape,

opposed refractory metal electrodes sealed into the arc tube, said electrodes being spaced less than 20 mm apart, said lamp having an electrode-stabilized arc, a specific arc load of from 100 to 300 W/cm of arc length, a wall loading of from 15 to 100 W/cm^2, an operating pressure of from 5 to 50 A, and

a filling containing at least one buffer gas, halogen gas, and metal halide additives which include at least tin halide and sodium halide, said lamp containing as the only halides, iodides or a mixture of iodides and bromides and, as the only halogens, iodine or a mixture of iodine and bromine.

4,171,499

ELECTRIC LAMP AND SOCKET CONSTRUCTION, PARTICULARLY INFRARED, ELONGATED, HIGH-POWER RADIATOR FOR PHOTO COPY APPARATUS, AND METHOD OF ITS MANUFACTURE

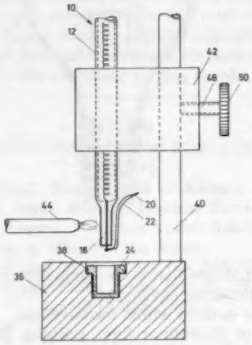
Joachim Scherzer, Bruchköbel, Fed. Rep. of Germany, assignor to Original Hanau Quarzlampen GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 812,796

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2634980

Int. Cl.[2] H01J *5/48, 5/50*

U.S. Cl. 313—318 **14 Claims**



1. Electric lamp structure having

a glass body (**12**);

an end press (**16**) which, in cross section, has an outer circumference which is formed with edges or corners (**28**);

a current conductor lead (**18**) extending through the end press;

a connecting terminal (**20**) electrically and mechanically secured to the current conductor lead (**18**);

and a generally cup-shaped socket (**24**) formed with a hollow recess and with axially extending lateral pockets,

wherein

the socket (**24**) comprises a heat-deformable, thermosetting material;

the edges or corners and adjacent portions of the end press are located in the lateral pockets extending from said hollow recess;

the inner surface of the cup-shaped socket is plastically deformed and grips around at least part of the edge or corners (**28**) of the end press and adjacent portions while leaving a space between the edges and the inner surface (**30**) defining the recess of the socket, the distance of penetration of the end press (**16**) within the hollow recess of the cup-shaped socket being predetermined.

7. In the production of an electric lamp structure having a glass body (**12**) having an end press (**16**) which, in cross section, has an outer surface which is formed with edges (**28**), an electrical current lead (**18**) extending through the end press, and electrical connection means (**20**) electrically and mechanically secured to the current conductor lead (**18**);

and a generally cup-shaped socket (**24**) formed with a hollow recess therein surrounding the end press (**16**) to locate the end press in the recess thereof,

the method to effect connection between the glass body and the socket comprising the steps of

providing a socket (**24**) of heat-deformable thermosetting material;

heating the socket (**24**) to a temperature at which the socket becomes plastically deformable, but which is below the melting temperature of the socket;

heating the end press (**16**) of the glass body (**12**) to a temperature which is above the melting temperature of the socket (**24**);

introducing the so heated end press (**16**) into the socket (**24**) while deforming the inner surfaces of the socket to flow around the edges (**28**) of the end press.

4,171,500

ELECTRIC LAMP

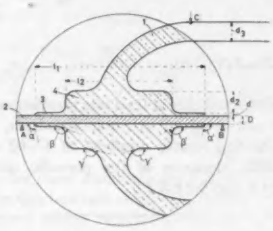
Johannes M. J. van Lieshout, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,480

Claims priority, application Netherlands, May 16, 1977, 7705365

Int. Cl.[2] H01J *5/50*

U.S. Cl. 313—331 **4 Claims**



1. An electric lamp which comprises: a glass vessel having a wall, first and second tungsten current lead-through conductors having external surfaces and a diameter D, said conductors extending through said wall in a vacuum-tight manner, an electric element disposed inside said lamp vessel which is connected to said conductors, said current lead-through conductors having a first glass layer of thickness d extending along a first axial portion of each conductor, a second glass layer disposed on said first glass layer extending along a second axial portion of each conductor, the axial extent of said second portion being intermediate and spaced from the axial extremities of said first portion, said second layer having an external surface, said first and second glass layers being fused together, said wall of said lamp vessel being fused to said second layer, said surfaces of each of said current lead-through conductors and said first layer, as well as of said first layer and said second layer, as well as of said said second layer and said wall of said lamp vessel enclosing at least one angle of at least 90° at the intersections thereof, said wall of said lamp vessel and said first and second glass layers consisting of more than 95% by weight of silicon dioxide, the ratio $D/(D+2d)$ being at least 0.7, said surface of said second glass layer extending in the axial direction of each of said conductors (on either side of the seal between said wall of said lamp vessel and said second layer) parallel to said surface of each current lead-through conductor.

4,171,501

LIGHT EMITTING DEVICES BASED ON THE EXCITATION OF PHOSPHOR SCREENS

Shinkichi Tanimizu, Kokubunji; Teruki Suzuki, Funabashi, and Tadashi Fukuzawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 516,953, Oct. 22, 1974, Pat. No. 4,107,571. This application Nov. 7, 1977, Ser. No. 849,241

Claims priority, application Japan, Oct. 22, 1973, 48/117966; Oct. 22, 1973, 48/117967

Int. Cl.[2] H01J *61/16, 61/44*

U.S. Cl. 313—486 **14 Claims**

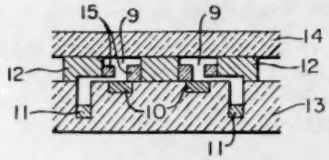
1. A light emitting device, comprising:

a light-permeable envelope,

an exciting source providing excitation energy ranging from 5 to 25 eV, said exciting source being a gas selected from

the group consisting of xenon, krypton, argon, neon, helium, or a mixture thereof, and

a luminescent screen which is provided inside said envelope at which it can convert said excitation energy from said exciting source into red visible light, said luminescent screen containing a phosphor represented by the general formula:



$$M_{1-a}Eu_aP_bV_{1-b}O_4$$

Where M stands for at least one member selected from the group consisting of yttrium, scandium, rare-earth elements having atomic numbers of 57–62 and 64–71, and group-IIIb elements of the periodic table, and where $0<a<1.0$ and $0<b\leqq 1.0$.

4,171,502

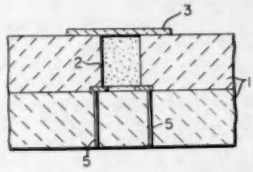
GASEOUS BREAKDOWN DISPLAY DEVICE

Alvin A. Milgram, Wilmington, Del., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 428,676, Dec. 27, 1973, abandoned, which is a division of Ser. No. 352,471, Apr. 18, 1973, Pat. No. 3,788,722, which is a continuation of Ser. No. 83,387, Oct. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 819,555, Apr. 28, 1969, abandoned. This application Aug. 15, 1974, Ser. No. 497,747

Int. Cl.[2] H01J *61/067, 61/30*

U.S. Cl. 313—517 **3 Claims**



3. A gas discharge information display device comprising in combination,

a common dielectric substrate having at least one planar surface,

a plurality of pairs of coplanar line bar electrodes on said at least one planar surface of said common dielectric substrate and conductors for connecting said electrodes to a source of operating potential, each said pair of line bar electrodes defining a specific portion of an information display when discharge potentials are applied to the pair of line bar electrodes, said line bar electrodes being a fired on precious metal,

a dielectric layer bonded to said at least one planar surface of said common dielectric substrate and to a portion of each said line bar electrodes, the remaining uncoated portion of said line bar electrodes having regions adapted to be exposed to and contact a gaseous medium,

a gaseous medium in the regions between the gas contacting portions of each electrode of coplanar line bar electrode pairs, respectively, and

means confining said gaseous medium to said regions.

4,171,503

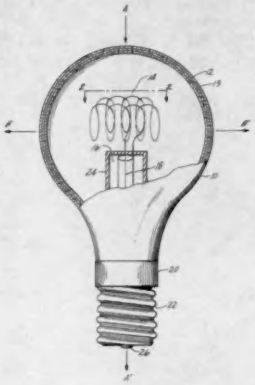
ELECTRODELESS FLUORESCENT LAMP

Young D. Kwon, 10125 Carol Lee Dr., Cupertino, Calif. 95014

Filed Jan. 16, 1978, Ser. No. 869,660

Int. Cl.[2] H05B *41/16, 41/24*

U.S. Cl. 315—248 **14 Claims**



1. An electrodeless fluorescent lamp comprising:

a sealed transparent envelope,

an ionizable medium within the envelope,

a coating of fluorescent light emitting phosphor on the interior surface of the envelope and luminously responsive to the ionized medium,

an induction coil wound in the form of a toroidal helix for generating a magnetic induction field and positioned so that at least a portion of the ionizable medium is within the boundaries of the toroid defined by the helical coil, and means for coupling electrical energy at radio frequency to said induction coil.

4,171,504

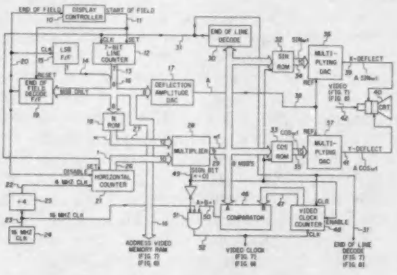
CONSTANT WRITING SPEED ARC SCAN CRT DISPLAY SYSTEM

Lyle R. Strathman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 18, 1978, Ser. No. 943,016

Int. Cl.[2] H01J *29/78*

U.S. Cl. 315—378 **11 Claims**



1. A constant writing speed arc-scanned cathode ray tube display, comprising first counter means for developing a linearly increasing count corresponding to successive arcs to be scanned including a first peripheral one of said arcs, means for generating in response to each successively outputted count from said first counter means a binary word defined by $N\div(N-n)$, where N is the total number of arcs definable from periphery to apex of said arc-scanned display and n is the number of arcs each successive arc is displaced towards the apex of said display from said peripheral one of said arcs;

means for developing a second linearly increasing count corresponding to successive ones of horizontal position increments along each said arc; means for multiplying said binary word by said second linearly increasing count; means responsive to the output of said means for multiplying and the output from said first counter means to generate respective horizontal and vertical deflection signals effective to cause the beam of said cathode ray tube to scan successive ones of said arcs, said last named means comprising respective ROM's addressed by the output of said means for multiplying to develop outputs respectively equated to the sine and cosine functions of the angle subtended by successive ones of said horizontal position increments along each said arc, and further means for multiplying each of the outputs from said ROM's by the output from said first counter means to develop respective vertical and horizontal deflection defining outputs, whereby said cathode ray tube beam is caused to scan each successive arc from the peripheral one of said arcs with a constant writing speed.

4,171,505

FAULT DETECTING SYSTEM FOR A CONTROL SYSTEM

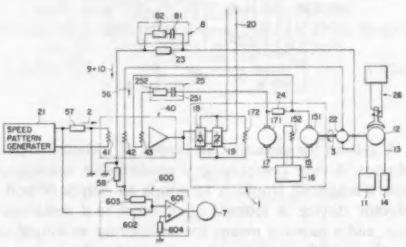
Seiya Shima; Hiroaki Kuroha, both of Katsuta; Ando Takeki, Naka; Hiromi Inaba, Hitachi; Toshiaki Kurosawa, Katsuta; Mutsuhiro Terunuma, Mito, and Yoshio Sakai, Naka, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 25, 1977, Ser. No. 845,062

Claims priority, application Japan, Oct. 26, 1976, 51-128619

Int. Cl.[2] G05B *5/00*

U.S. Cl. 318—316 **26 Claims**



1. A fault detecting system for control apparatus, comprising: a control unit; means for generating a command signal representative of a desired value of a controlled variable which is to be obtained by said control unit; means for deriving a feedback signal representative of an actual value of the controlled variable which is obtained as an output of said control unit; means for deriving a damping signal representative of a variation in an arbitrary fluctuating element which is associated with said controlled variable; first and second comparator means for comparing said command signal with a sum of said feedback signal and said damping signal; means for entering an output of said first comparator means into said control unit; and fault detecting means coupled to an output of said second comparator to detect when an absolute value of the output of said second comparator means exceeds a predetermined value.

4,171,506

CONTROL APPARATUS FOR AN ELECTRIC CAR

Michimasa Horiuchi; Hiroshi Narita, and Takashi Tsuboi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 7, 1977, Ser. No. 813,668

Claims priority, application Japan, Jul. 14, 1976, 51-82948

Int. Cl.[2] H02P *5/06*

U.S. Cl. 318—338 **17 Claims**

1. In an electric car comprising:

a power source;

a motor including a field coil and an armature winding;

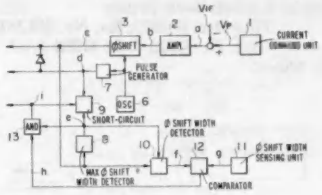
a smoothing reactor which smooths a current flowing through the motor;

a chopper which controls the current flowing through the motor;

a freewheel rectifier which, at the on-off control of the chopper, circulates energy accumulated in the smoothing reactor;

a short-circuit checking device which checks a short-circuit of a motor voltage and which is interposed between the armature and the field coil of the motor;

first means for short-circuiting the field coil of the motor, the smoothing reactor and the chopper through the short-circuit checking device;



second means for short-circuiting the armature of the motor through the short-circuit checking device;

a current control system which controls the current of the motor to a value responsive to a current command;

means for detecting changes in running states of the electric car, including changes in the voltage of said power source and changes in said current command and producing a detected signal indicative of said running state; and

means for controlling a field current of said motor in response to the detected signal indicative of said running states of the electric car to maintain the field current at substantially the same level before and after the operations of said first and second means.

4,171,507

ELECTRIC VEHICLE TRACTION MOTOR CONTROL

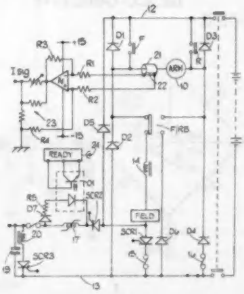
John F. Joyes, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 7, 1978, Ser. No. 884,109

Claims priority, application United Kingdom, Mar. 9, 1977, 9839/77

Int. Cl.[2] H02P *5/12*

U.S. Cl. 318—345 C **7 Claims**



1. An electric vehicle traction motor control circuit comprising a main thyristor connected in series with the motor between a pair of supply rails, a second thyristor connected in series with a commutating capacitor across said main thyristor, a third thyristor connected in series with an inductor across the commutating capacitor, first firing means for firing the main thyristor when the motor current is below a lower limit and for

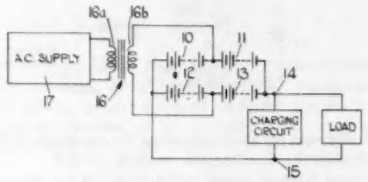
firing the second thyristor when the motor current exceeds an upper limit, means including a driver operable control device for producing a current demand signal determinative of said upper and lower limits, and second firing means for firing the third thyristor to reverse the voltage on the commutating capacitor following commutation, said first firing means including an oscillator for producing a pulse train for triggering a pulse generator to supply thyristor firing pulses to said main and second thyristors.

4,171,508

CIRCUITS FOR HEATING STORAGE BATTERIES

Walter Sinclair, Hemel Hempstead, England, assignor to Lucas Industries Limited, Great Britain

Filed Dec. 8, 1977, Ser. No. 858,551
Int. Cl.[2] H02J 7/00; H05B 3/60
U.S. Cl. 320—2 **3 Claims**



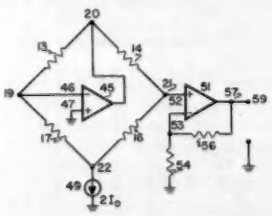
1. A battery heating circuit comprising a transformer having a primary winding connection to an a.c. supply and a secondary winding having at least two output terminals, at least two pairs of batteries, and a positive and a negative d.c. output terminal, in each pair of batteries the positive pole of one battery being connected directly to the positive d.c. output terminal, the negative pole of said one battery being connected at the common terminal of the pair of batteries to the positive pole of the other battery, and the negative pole of said other battery being connected directly to the negative d.c. output terminal, and the output terminals of the secondary winding being connected to respective common terminals of the pairs of batteries.

4,171,509

BRIDGE DRIVE CIRCUIT AND METHOD

Mark L. Stephens, Campbell, and Paul R. Gray, Orinda, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Jan. 19, 1978, Ser. No. 870,620
Int. Cl.[2] G01L 1/18
U.S. Cl. 323—75 C **6 Claims**



1. In a measurement bridge of the type using four impedance arms for providing a bridge output referenced to ground which is a function of the impedances in the respective arms, the bridge circuit comprising,

an impedance bridge including first, second, third and fourth impedance arms connected in a series loop with first, second, third and fourth bridge terminals serially defined at the connections between the respective arms,

current source means connected between said first terminal and ground for providing a predetermined fixed value of current therebetween,

drive means having inverting and non-inverting inputs and an output, said inverting input connected to the second bridge terminal, the non-inverting input connected to ground and the output connected to the third bridge terminal,

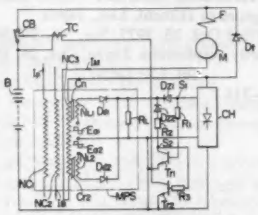
said drive means being responsive to signals at the inputs for driving the second terminal to ground potential to provide a bridge output between said fourth terminal and ground which is a function of the impedances in the respective arms.

4,171,510

SYSTEM FOR DETECTING OUTPUT OF CONTROLLABLE SEMICONDUCTOR DEVICE

Hisakatsu Kiwaki; Masahiko Ibamoto, both of Katsuta; Masato Suzuki, Hitachi; Jinichi Toyama, and Shigeru Kuriyama, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 20, 1977, Ser. No. 844,120
Claims priority, application Japan, Nov. 4, 1976, 51-131780
Int. Cl.[2] H02P 5/16, 5/18
U.S. Cl. 323—89 M **9 Claims**



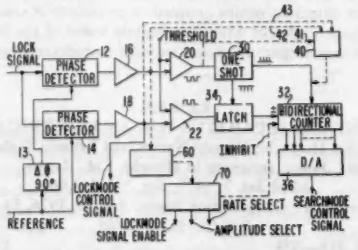
1. A system for detecting an output of a controllable semiconductor device comprising a controllable semiconductor device, a magnetic amplifier to which an output of said semiconductor device is fedback to control said semiconductor device, and a monitor means for monitoring an output of said magnetic amplifier and for determining that the output of said semiconductor device exceeds a predetermined level, when the output of said magnetic amplifier is in a remanent output region of said magnetic amplifier.

4,171,511

AUTOMATIC FIELD-FREQUENCY LOCK IN AN NMR SPECTROMETER

Howard D. W. Hill, Cupertino, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 14, 1978, Ser. No. 896,410
Int. Cl.[2] G01R 33/08
U.S. Cl. 324—313 **16 Claims**



1. In an impulse NMR spectrometer comprising lock chan-

nel excitation means, for exciting resonance in a sample, field-frequency lock error signal responsive means for maintaining a desired field-frequency relationship, said spectrometer including quadrature phase detection means for phase resolving free induction decay signals, the improvement comprising:

a bidirectional counter responsive to the frequency of a first phase resolved signal and means for comparing the phase of said quadrature free induction signals to derive a binary output indicative of the sign of said phase difference;

the sense input of said bidirectional counter responsive to said binary phase difference signal;

digital-to-analog conversion means operative upon the output of said bidirectional counter for developing a search mode analog signal in response to the digital content of said counter for correction of the field-frequency relationship in said spectrometer by said error signal responsive means.

4,171,512
CIRCUIT FOR PREVENTING BREAKDOWN OF A LOAD RESULTING FROM WRONG CONNECTION OF A POWER SOURCE

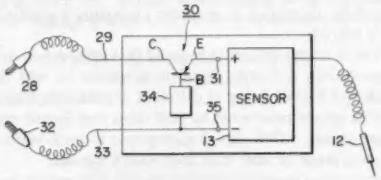
Shin Tsuda, Kawagoe, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 665,180, Mar. 9, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,392

Claims priority, application Japan, Mar. 14, 1975, 50-30707

Int. Cl.[2] G01R *19/16, 1/36;* **H02H** *9/00*

U.S. Cl. 324—133 **7 Claims**



1. A circuit for preventing breakdown of a load resulting from a wrong connection of a power source, comprising:

a first load to which a DC voltage source should be applied at a predetermined polarity and to which a reverse-polarity connection of the DC voltage source should be prevented, wherein the DC voltage applied to the first load is a regulated voltage;

a second load the output of which controls said first load, wherein the DC voltage applied to the second load is not required to be regulated;

a transistor having the base electrode thereof connected to one side of said second load, one electrode of said transistor other than said base electrode being connected to one terminal for connection with said DC voltage source, said first load being connected between the other side of said second load and the other transistor electrode, wherein said other electrode has a lower reverse-withstanding voltage than the reverse-withstanding voltage of the junction between said base electrode and said one electrode, wherein said first and second loads are set to permit a current flow which operates said transistor in its saturation range; and

means for connecting said other side of said second load to another terminal for connection to said DC voltage source.

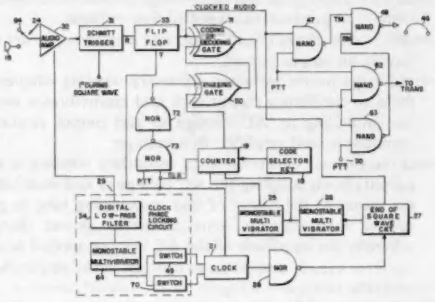
4,171,513
SECURE COMMUNICATIONS SYSTEM

Charles R. Otey, Reeds Ferry, and Burton C. Winkler, Jr., Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 578,422, Sep. 6, 1966. This application Jul. 22, 1969, Ser. No. 853,582

Int. Cl.[2] H04K *1/00;* **H04L** *9/00*

U.S. Cl. 325—32 **1 Claim**



1. A privacy communications system, comprising:

means for generating a digital signal;

means for generating a pseudo-random digital code signal;

means for generating a clock signal, and

a signal combining and separating circuit, including first and second exclusive OR gates,

said first exclusive OR gate having inputs from the system clock means and from the output of said means for generating a pseudo-random digital code signal,

said second exclusive OR gate having inputs from said first exclusive OR gate and from the output of said means for generating a digital signal.

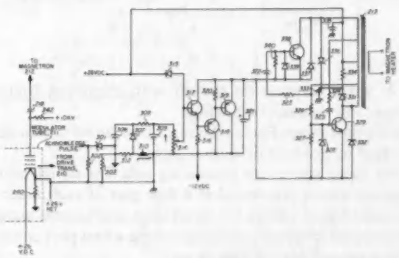
4,171,514
RADAR SYSTEM WITH STABLE POWER OUTPUT

Merle W. Faxon, Kingston, N.H., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 714,424, Aug. 13, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 861,055

Int. Cl.[2] H04B *1/04*

U.S. Cl. 325—121 **7 Claims**



1. In combination:

a transmitting tube for producing radar pulses of microwave energy in a radar system;

modulator tube means having an anode and a cathode and a control electrode;

an external source of power;

a resistor for producing a first voltage connected in series with the cathode of said modulator tube means and said external source of power, the anode of said modulator tube means being connected in circuit with said external

source of power and said resistor in a manner adapted to couple anode input power to an electrode of said transmitting tube from said external source of power in response to input pulses at said control electrode;

said modulator tube means being connected to develope a value of said first voltage across said resistor according to the amount of said anode input power;

a heater for producing thermionic emission of the cathode of said transmitting tube;

means for amplifying said first voltage produced across said resistor to produce an amplified first voltage;

multivibrator means connected to said amplifying means and having an output circuit;

transformer means including a primary winding adapted to form an oscillatory circuit with said multivibrator means for producing an AC voltage in said output circuit in response to said amplified first voltage;

said transformer means having a secondary winding in said output circuit coupling the AC voltage of said multivibrator means to the heater of said transmitting tube to provide a sole source of external heater power thereto, whereby the amplitude of the AC voltage applied to said heater is varied in response to changes in the amplitude of said first voltage;

the freguency of oscillation and resulting output of said multivibrator means being determined by the inductance of said primary winding; and

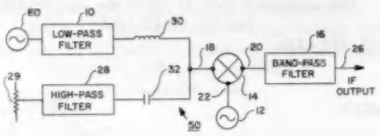
said multivibrator means including means in response to a change in range setting in said radar system to vary the amplitude of said first voltage and the output of said multivibrator means in a direction to maintain a constant peak power level in said radar pulses of microwave energy not withstanding the change in radar range setting.

4,171,515

MIXER TERMINATION FOR FLAT FREQUENCY RESPONSE

Gordon D. Long, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 9, 1978, Ser. No. 932,251
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—436 **3 Claims**



1. A mixer termination system with improved frequency response, the system comprising:

a three-port mixer for combining a first signal with a second signal to produce an output signal;

a first signal source for generating said first signal, said first signal source connected to a first port of said mixer;

a second signal source for generating said second signal;

a three-port frequency diplexer having a first port connected to a second port of said mixer;

a low pass filter connected between a second port of said frequency diplexer and said second signal source, said low pass filter being matched to the source impedance of said second signal source;

a band pass filter connected to a third port of said mixer for passing said output signal; and

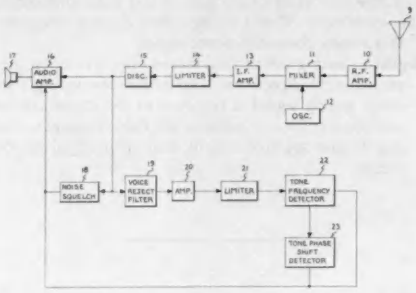
a filter connected to a third port of said frequency diplexer, said filter including a resistive termination matched to the source impedance of said second port of said three-port mixer at frequencies within the passband of said filter.

4,171,516

TONE PHASE SHIFT DETECTOR

Richard F. Challen, Lynchburg, and Terry N. Garner, Forest, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Nov. 23, 1977, Ser. No. 854,060
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—466 **11 Claims**



1. In a receiver that detects the frequency of audio tones by repetitively producing vector signals each having an angular indication of the frequency of said tones, an improved circuit for detecting a phase shift in said audio tones comprising:

a. first means for producing a first signal having a magnitude and angle representing an average of said vector signals;

b. second means for producing a second signal in response to each of said vector signals, each of said second signals having a magnitude and angle representing each of said vector signals are produced;

c. third means connected to said first and second means for producing a third signal in response to the sum of said first and second signal magnitudes exceeding a predetermined threshold;

d. fourth means connected to said first and second means for producing a fourth signal in response to said first and second signals being in different angular quadrants;

e. fifth means connected to said third and fourth means for producing a fifth signal in response to each simultaneous occurrence of said third and fourth signals;

f. and output means connected to said fifth means for counting said fifth signals.

4,171,517

APPARATUS FOR SYNCHRONIZATION CONTROL OF A PLURALITY OF INVERTERS

Osamu Higa, and Nagataka Seki, both of Fuchu, Japan, assignors to Tokyo Shibaura Electric Company, Limited, Tokyo, Japan

Filed Jan. 25, 1977, Ser. No. 762,279
Int. Cl.[2] H03K *17/00, 5/20*
U.S. Cl. 328—72 **8 Claims**

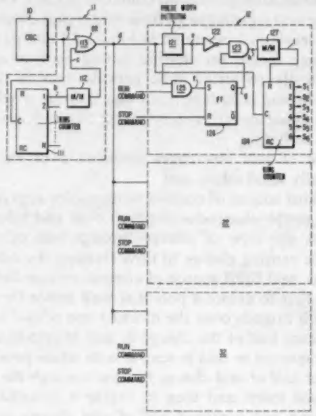
1. An apparatus for the synchronization control of a plurality of inverters, comprising:

a reference oscillator;

synchronizing signal generating means responsive to the output of the reference oscillator for generating distinct synchronizing signals, for adding the generated synchronizing signals to the output of the reference oscillator, and for supplying an output corresponding to the sum thereof; and,

a plurality of gate control means responsive to the output of the synchronizing signal generator for controlling the gates of the inverters, each gate control means coupled to a respective inverter, and comprising a synchronizing signal detector for detecting synchronizing signals from

the output of the synchronizing signal generating means, and a ring counter responsive to output of the synchroniz-



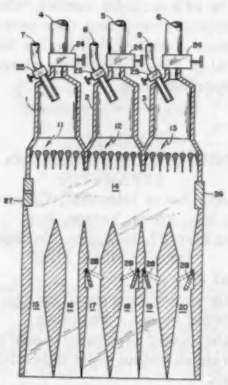
ing signal generating circuit means and controlled by the output of the synchronizing signal detector circuit means.

4,171,518

APPARATUS FOR AND METHOD OF REGULATING THE OUTPUT POWER OF GASEOUS LASERS

John A. Denner, Jr., Saugus, and Richard A. Allen, Lincoln, both of Mass., assignors to Avco Corporation, Greenwich, Conn.

Filed Oct. 1, 1968, Ser. No. 766,024
Int. Cl.[2] H01S *3/02*
U.S. Cl. 331—94.5 G **8 Claims**



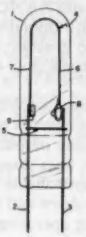
1. In a gas dynamic laser the combination comprising:
(a) a plurality of controllable sources of a high temperature gas;
(b) an optically resonant cavity;
(c) nozzle means disposed between said sources and said cavity for separately receiving said gas from said sources and introducing said gas into said cavity;
(d) a plurality of diffuser means for substantially separately receiving said gas from said cavity; and
(e) means for blocking at least one but less than all of said diffuser means to prevent the flow of gas therethrough.

4,171,519

CIRCUIT BREAKER WITH PARALLEL SHORTING ELEMENT

Robert E. Cassidy, Seabrook, N.H., and Frank M. Latassa, Magnolia, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 26, 1978, Ser. No. 909,893
Int. Cl.[2] H01H *61/00*
U.S. Cl. 337—25 **3 Claims**



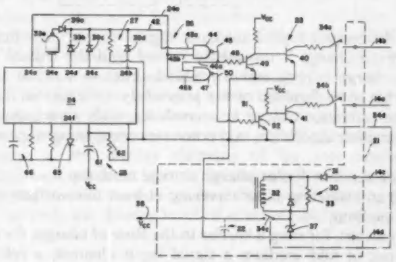
1. A circuit breaker for shutting off heater current in a rapid start fluorescent lamp comrising: a sealed glass envelope having two lead-in wires extending therethrough; a U shaped bimetal within said envelope mounted on one of said lead-in wires and making electrical connection to the other lead-in wire at room temperature but separated therefrom at a predetermined elevated temperature; an electrically conductive bypass element, within said envelope across said lead-in wires in parallel with said bimetal, of the type that can be melted by a short duration pulse of high electric current; and means on the bimetal to prevent it from welding itself together because of an arc occurring upon melting of the bypass.

4,171,520

TRANSPONDER SYSTEM INCLUDING AN OSCILLATOR/RIPPLE COUNTER CONTROLLING A FIXED GRAY CODE LOGIC NETWORK IN CIRCUIT WITH A DRIVER/GATE CIRCUIT FOR GENERATING "RED-ALERT" END CONDITION DIGITAL SIGNALS IN A STORAGE TANK GAUGING SYSTEM

John S. Adamson, Pleasant Hill, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 25, 1977, Ser. No. 855,032
Int. Cl.[2] H04Q *9/00*; G08B *21/00*
U.S. Cl. 340—152 T **11 Claims**



1. Transponder network for generating a "red-alert" digital code upon (i) occurrence of an overflow condition within a storage tank under survey and (ii) receipt of a square wave interrogation signal from a transmitter/receiver of a tank gauging system located at a central station remote from said storage tank but electrically connected to said transponder network through an INTERROGATION, a MARK and a SPACE line of said tank gauging system, comprising:
(A) I/O network for receiving said interrogation signal

including voltage divider means for generating a microcircuit drive voltage for a period concident with the pulse width of said interrogation signal;

(B) an oscillator/ripple counter formed essentially of MSI's connected to said I/O network and including at an input, a power-on-reset network for generating a reset pulse for said oscillator/ripple counter, said oscillator/ripple counter generating, in response to said reset pulse, sets of square wave pulses of differing repetition rates and pulse widths;

(C) an encoding means and NAND gate means connected to each other and to (B) responding to selected sets of said square wave pulses to generate a synthetic digital code at microcircuit signal levels at an output means of said gate means;

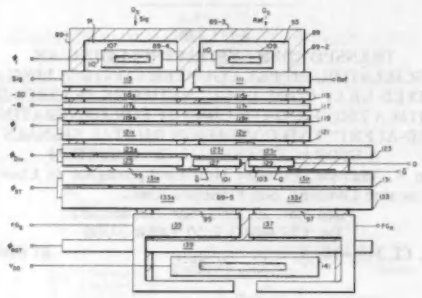
(D) drive means including switching transistor means having one or more inputs connected to said NAND gate means of (C), and one or more output means connected to said MARK and SPACE lines through said I/O of (A), said drive means being controllable as a function of said synthetic digital code to drive said MARK and SPACE lines between tank gauging operating potentials for generating said "red-alert" digital code of interest at said central station whereby said overflow condition within said storage tank can be indicated.

4,171,521

CHARGE-COUPLED ANALOG-TO-DIGITAL CONVERTER

Chi-Shin Wang, San Jose, and Ching-Lin Jiang, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 2, 1977, Ser. No. 802,835
Int. Cl.[2] H03K *13/03*
U.S. Cl. 340—347 AD **4 Claims**



1. A charge coupled analog-to-digital converter, wherein a reference charge is repeatedly halved, and the halved reference charge is progressively added either to a signal charge which is to be digitized or to a previously accumulated fraction of the reference charge in accordance with a successive approximation algorithm, said converter comprising in combination:

(a) a semiconductor charge storage medium;

(b) an insulating layer covering at least one surface of said medium;

(c) means, forming a barrier to the flow of charge, for defining in said medium a signal input channel, a reference input channel, a signal sensing channel, and a reference sensing channel, said signal input channel opening into said signal sensing channel and said reference input channel opening into both said signal sensing and reference sensing channels through equally sized inlets;

(d) a plurality of electrodes supported over said channels by said insulating layer;

(e) input means, including a first source of control voltages and certain of said plurality of electrodes spaced from said sensing channels, for individually injecting and storing in respective ones of said signal and reference input channels, signal and reference charges;

(f) means, including certain of said plurality of electrodes, and also including a second cource of control voltages, for shifting said signal charge from said signal channel to said signal sensing channel and holding said charge there;

(g) dividing means for shifting during each of a series of periodically recurring time periods, half of the charge stored in said reference input channel into a selected one of said signal and reference sensing channels, said dividing means including

(1) one of said electrodes disposed over each of said equally sized inlets, and

(2) a third source of control voltages for applying potentials to the electrodes disposed over said inlets so as to block the flow of charge through one of said inlets while causing charge to flow through the other of said inlets, said third source of control voltage being operative first to create a potential well under the electrode which extends over the blocked one of said inlets so as to cause half of the charge in said reference channel to be captured in said potential well while permitting the other half of said charge to flow through the other one of said inlets and then to create a potential gradient causing said captured half of said charge to return to said reference channel;

(h) means, including a pair of additional electrodes supported over said medium by said insulating layer, for sensing the relative magnitude of the charges stored in said signal and reference sensing channels after each of said recurring timer periods; and

(i) control means coupled between said sensing means and selected ones of the electrodes forming said dividing means for causing said dividing means to shift charge to said selected one of said signal and reference sensing channels after each of said recurring time periods in response to the relative charge magnitudes sensed by said sensing means so that it is always the lesser of the compared charges that is increased, said control means having two output states, each occurring when a respective one of the sensed charges is greater, said two output states respectively representing a binary "1" and a binary "0" for a given bit of a multi-bit number, whereby, after each of said periodically recurring time periods, said control means assumes a state signalling the binary value of a successive bit in a multi-bit binary number generated by successive approximation.

4,171,522

ELECTRONIC ANGULAR POSITION ENCODER APPARATUS

J. Anthony Powell, North Olmstead, Ohio, assignor to Real Time Systems, Inc., Mount Vernon, N.Y.

Filed Mar. 22, 1978, Ser. No. 889,018
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 P **10 Claims**

1. Apparatus for providing a signal indicative of the angular position of a rotating object, comprising:

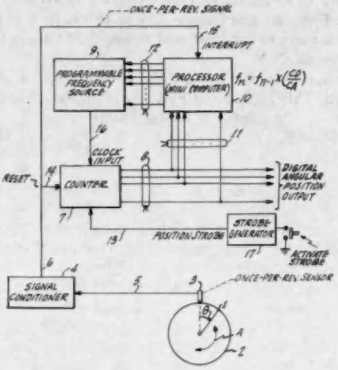
(a) sensor means located proximate to said object and operative to provide an output pulse indicative of a revolution of said object,

(b) a controllable frequency source capable of providing a signal frequency at an output selected according to the velocity of rotation of said object and having an input adapted when activated to vary said frequency according to the velocity of rotation of said object,

(c) a counter having an input coupled to said frequency source and operative to provide at an output a code indicative of said signal frequency as applied to said input, said counter responsive to said sensor output pulse to provide said code during each revolution of said object,

(d) processing means having an input coupled to said counter output for responding to said code to determine if

said code manifests a first value within a predetermined range indicative of a desired rotational velocity of said object and for providing an output control signal indicative of said desired rotational velocity when said first value is not within said range, and

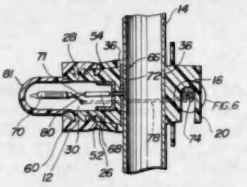


(e) means coupling the output of said processing means to said control input of said frequency source to cause said source to provide another frequency according to said processing output signal to cause said counter to provide said code indicative of said angular position of said object and relatively independent of said velocity.

4,171,523
SIGNAL LIGHT

Felix Parkitny, Addison, Ill., assignor to International Electric Co., Chicago, Ill.

Filed Jul. 13, 1978, Ser. No. 923,927
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—654 **2 Claims**



1. A device for supporting an electrically conductive fence wire and securely mountable on a plurality of metal posts comprising:

an insulator body formed of insulative material and including fence wire retaining means capable of holding the fence wire, and further including an elongated, partially hollowed, threaded shaft having a post-receiving opening therethrough with entry and exit for the post;

a washer formed of insulative material and having a shaft-receiving orifice therethrough, said washer mounted on said shaft of said body passing through said orifice with said washer movable toward and away from said rod-receiving opening and capable of overlapping said opening of said shaft to reduce the effective size of said rod-receiving opening to bear against and closely confine said post within said opening;

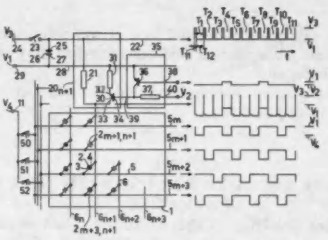
a threaded nut threadably engaging said threaded shaft and adjacent said washer and in response to rotation of said nut urging said washer along said shaft toward said opening to successively further overlap said opening so as to be capable of gripping a rod between said washer and said body to securely hold said body on the post;

the improvement comprising a wire clip in said fence wire retaining means in which said fence wire is seated, a lamp positioned in said hollow of said shaft, said clip electrically connected to one side of said lamp, a metal plate frictionally secured in said post receiving opening of said shaft, and said plate electrically connected to the other side of said lamp.

4,171,524
DISPLAY DEVICE HAVING A MATRIX OF GAS DISCHARGE DISPLAY ELEMENTS

Jean H. J. Lortelje; Geert Warrink; Gerhard H. F. deVries, and Jacques A. M. Hulshof, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1977, Ser. No. 835,734
Claims priority, application Netherlands, Dec. 29, 1976, 7614514
Int. Cl.[2] H01J 17/48
U.S. Cl. 340—713 **10 Claims**



1. A display device comprising a matrix of d.c. gas discharge display elements disposed together in a gas-filled space and each having a bistable current-voltage characteristic and a first and a second supply electrode, a control circuit having a plurality of row conductors and a plurality of column conductors, means connecting the first supply electrode of each display element to one of the row conductors and the second supply electrode to one of the column conductors such that each display element couples a different combination of a row conductor and a column conductor, a row scanning circuit for successively periodically scanning each of the row conductors for a given period, a plurality of column selection circuits for selecting those display elements to be energized with a d.c. display current during said given period in which a row conductor is scanned, which column selection circuits effect at the beginning of the scan of a row conductor the excitation of all display elements connected to the scanned row conductor, each column selection circuit comprising a quiescent current supply circuit which couples a column conductor to a d.c. voltage source for supplying a quiescent current to the non-selected display elements connected to the scanned row conductor during said given period and at a level to produce a gas discharge in the display elements of the row conductor scanned, said quiescent current having a low value such that the display level of the non-selected display elements is negligible relative to the display level of selected display elements.

4,171,525
VLF LOOP ARRAY ANTENNA

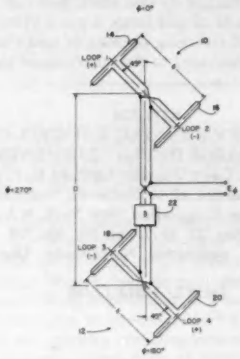
Elwin W. Seeley, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1978, Ser. No. 893,548
Int. Cl.[2] H01Q 3/36
U.S. Cl. 343—853 **5 Claims**

1. An antenna system for receiving very low frequency communication signals having a narrow reception beamwidth

with elements whose dimensions are a fraction of a wavelength comprising:

(a) first and second pairs of coaxial loop arrays dispersed with their axis parallel at 45° from the horizontal;



(b) each of said pairs of coaxial loop arrays being separated by less than a wavelength and connected so they are 180° out-of-phase; and

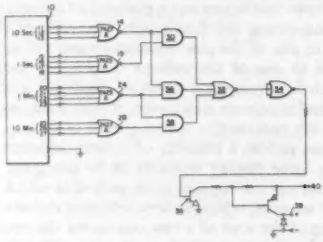
(c) delay circuit means connecting said first and second pairs of coaxial loop arrays.

4,171,526

EVENT MARK DECODER FOR USE WITH TIME CODE GENERATOR

Peter W. Bauer, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1978, Ser. No. 947,982
Int. Cl.² G01D *9/00*
U.S. Cl. 346—23 **8 Claims**



1. An event mark decoder for use with a time code generator the combination comprising:

first decoding means coupled to said time code generator for providing an output pulse of a first predetermined duration after a first periodically occurring time interval,

second decoding means coupled to said time code generator for providing an output pulse of a second predetermined duration after a second periodically occurring time interval,

third decoding means coupled to said time code generator for providing an output pulse of a third predetermined duration after a third periodically occurring time interval,

fourth decoder means coupled to said time code generator for providing an output pulse of a fourth predetermined duration after a fourth periodically occurring time interval,

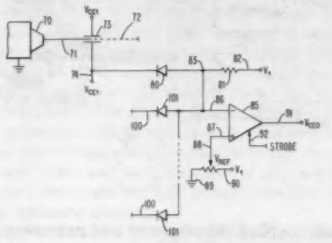
logic circuit means coupled to said first, second, third, and fourth decoder means for providing an output pulse of said first predetermined duration every said second predetermined time interval, an output pulse of said second predetermined duration every said third predetermined time interval and an output pulse of a fifth predetermined duration every said fourth predetermined time interval.

4,171,527

INK JET CONTAMINATION DETECTING SYSTEM

Edward T. Osborne, and Danny A. Van Hook, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 868,110, Jan. 9, 1978, abandoned. This application Feb. 28, 1978, Ser. No. 882,284
Int. Cl.² G01D *18/00*
U.S. Cl. 346—75 **11 Claims**



1. In an electrostatic ink jet assembly having at least one nozzle means for projecting electrically conductive ink to form drops, charging electrode means for electrostatically charging said drops; and deflection electrode means for deflecting charged drops; the improvement for detecting contamination of any of said electrode means by said electrically conductive ink comprising:

means for establishing an electrical signal whose amplitude is related to the amplitude of an electrical current flow conducted by said contaminating electrically conductive ink at any of said electrode means; and

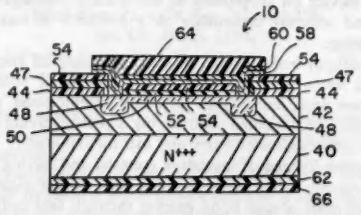
signalling means for signalling the detection of said contamination upon said electrical signal exceeding a predetermined amplitude.

4,171,528

SOLDERABLE ZENER DIODE

Harry C. Kling, Boxford, Mass., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 806,133, Jun. 13, 1977, abandoned. This application Nov. 3, 1978, Ser. No. 957,494
Int. Cl.² H01L *29/90*
U.S. Cl. 357—13 **12 Claims**



1. A solderable zener diode, comprising:

a body of semiconductive material having a first type of semiconductivity, said body having opposed front and back surfaces;

an electrical contact formed on the back surface of said body;

a shallow region of second type of semiconductivity formed

in the front surface of said body opposite said electrical contact and in PN junction forming relation with the first type of semiconductivity of the body;

a deep diffused region of second type of semiconductivity formed in the front surface of said body in contact with and about the entire periphery of the shallow region;

a dielectric layer formed on the entire surface of the shallow region and an adjacent portion of the deep diffused region about the shallow region; and

an electrical contact alloyed into said dielectric layer over the shallow region and the deep diffused region thereby providing a hermetic seal, said contact being connected to the deep diffused region over the entire length thereof and about the entire periphery of the shallow region.

4,171,529

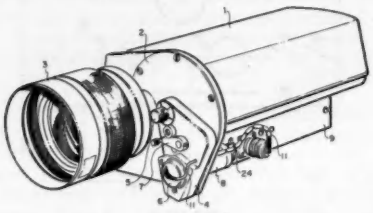
PHASE CONTROLLED SHUTTERING SYSTEM

George G. Silberberg; Pat N. Keller, both of Ridgecrest, and Richard O. White, China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1978, Ser. No. 903,339

Int. Cl.[2] H04N 5/26

U.S. Cl. 358—209 **8 Claims**



1. A phase control shuttering system comprising:

a driving mechanism;

two disc shutters, mounted on said driving mechanism;

semaphore means, coupled to said driving mechanism, for signaling the position of said shutters; and

servo circuit means, coupled to said semaphore means and to a television camera, for adjusting the rotation of said shutters;

whereby said shutters are phase synchronized with the vertical retrace time of said television camera.

4,171,530

SYSTEM FOR THE ELECTRONIC EDITING OF VIDEO SIGNALS

Günter Landau, Scheppenhausen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 15, 1977, Ser. No. 777,825

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611113

Int. Cl.[2] G11B 21/04, 21/02

U.S. Cl. 360—70 **3 Claims**

1. A system and a circuit for electronic editing of video signals recorded by the diagonal track method on a magnetic tape, comprising, in combination:

a rotatable head-wheel including a plurality of video recording heads and video erasing heads;

a head-wheel motor in driving relation with said head-wheel and controlled by a first control signal;

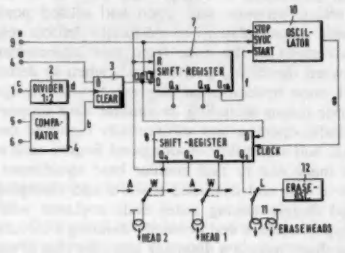
moving means operable for moving said magnetic tape between two reels and comprising a capstan, and a capstan motor in driving relation with said capstan and controlled by a second control signal;

first monitoring means operable for generating a first tachometer signal proportional to the speed of said head-wheel motor;

second monitoring means operable for generating a second tachometer signal proportional to the speed of said capstan motor;

a source of a reference signal; said first monitoring means including a comparator coupled to said source of the reference signal and operable for generating said first control signal; and

generating means coupled to said source of the reference signal including a control device and synchronizing means, said synchronizing means being operable for generating a third control signal which is to be recorded on a



control track portion of said magnetic tape during the recording of video signals and which during the playback of the video signals, is compared to said second tachometer signal to generate said second control signal,

said control device being controlled by said third control signal and being operable for alternatively

activating and deactivating said video erasing heads and said video recording heads,

said synchronizing means receiving said first and second control signals, being coupled to said control device, and comprising a shift register.

4,171,531

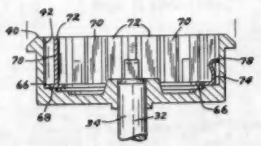
DEVICE FOR CENTERING AND DRIVING FLEXIBLE DISCS

Robert D. Grapes, Oklahoma City, and Donald J. Watson, Bethany, both of Okla., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Nov. 9, 1977, Ser. No. 849,924

Int. Cl.[2] G11B 25/04

U.S. Cl. 360—99 **11 Claims**



1. An apparatus for centering, on a longitudinal drive axis, a flexible disc having means defining a circular drive hole and an inner rim adjacent the drive hole; said apparatus including:

a spindle rotatable on said drive axis and having a substantially planar disc support surface normal to said drive axis and means defining in said surface an opening extended inwardly thereof;

a clamping member including a truncated cone generally centered on said drive axis having a first end with a diameter substantially equal to the diameter of a drive hole in a flexible disc and convergent to a second end nearer said spindle and having a diameter substantially less than said

drive hole diameter, the clamping member further including a flange adjacent the cone at said first end and extended radially outward thereof;

means for selectively locating said clamping member axially of said spindle between an open position remote from the spindle; and a closed position wherein said cone extends through the drive hole and then into said spindle opening, wherein a disc is centered on the cone, and wherein said flange and said disc support surface frictionally engage an inner rim of the disc at opposite sides thereof; and

flexible guide means mounted within said spindle opening and positioned to engage said cone at an intermediate position between said open and closed positions, said guide means adapted to elastically deform responsive to movement of the cone from said intermediate position toward the closed position and, when so deformed, urge the cone toward axial alignment with the spindle; said guide means including an annular base supported in said spindle opening and substantially centered on the drive axis, and a plurality of alongated fingers each mounted at an inner end to said annular base equidistant from said drive axis and extended toward said clamping member; said fingers having outer ends coplanar with said disc support surface and normally defining a circular cylindrical shape having a diameter less than that of said first end of the cone and substantially larger than the diameter of said second end;

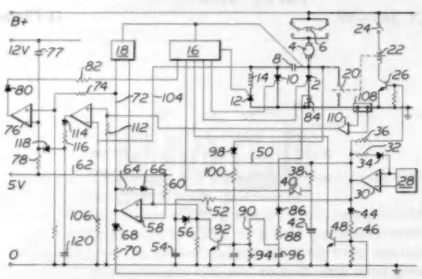
said guide means further includes a plurality of brackers mounted to the base and extending therefrom, each bracket having a forked end at the free end thereof which extends radially outward from said base; and said spindle includes in said opening a longitudinal rib associated with each bracket;

each forked portion engaging its associated rib thereby preventing rotation of the guide means relative to said spindle.

4,171,532
THYRISTOR PULSE CONTROL CIRCUITS

Albert E. Sloan, Gateshead, and Arthur Wild, Newcastle-upon-Lyne, both of England, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 24, 1978, Ser. No. 909,246
Int. Cl.[2] H01H *9/38*
U.S. Cl. 361—13 **9 Claims**



1. In a thyristor pulse control circuit having a main thyristor for connection between a load and a d.c. source, means for gating the thyristor into conduction, a commutation circuit including a commutating capacitor and means for charging the commutating capacitor and for connecting the charged capacitor across the main thyristor so as to reverse bias and thus commutate it, and a bypass contactor connected in parallel with the main thyristor so that on closure of the bypass contactor the load is connected direct to the d.c. source, the improvement comprising:

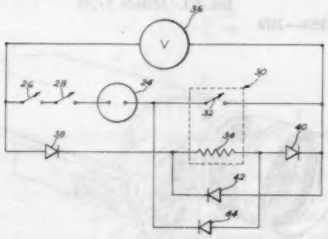
circuit means for causing a gating signal to be applied to the main thyristor immediately before the contacts of the bypass contactor close and for causing a gating signal to be applied to the main thyristor immediately before the contacts of the bypass contactor open; and

comparator means for comparing the voltage across the commutating capacitor with a voltage dependent on the magnitude of load current flowing immediately before the contacts of the bypass contactor open and operable to inhibit operation of the circuit means causing a gating signal to be applied to the main thyristor when the load current exceeds a preselected value which can be safely commutated by the commutating capacitor at the measured voltage.

4,171,533
LOW VOLTAGE PROTECTION CIRCUIT FOR INDUCTION MOTORS

Paul D. Schrader, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 23, 1978, Ser. No. 889,327
Int. Cl.[2] H02H *7/09*
U.S. Cl. 361—22 **3 Claims**



1. In an improved low voltage protection circuit for an a.c. motor of the type comprising

first switching means for applying a source of a.c. potential across said motor when activated, and

resistance means operatively associated with said first switching means for activating said first switching means when a current through said resistance means is at least equal to a minimum value, the improvement of which comprises second switching means including:

a first pair of diodes connected to and on each side of said resistance means, the resulting series combination of which is connected across the series combination of said motor and first switching means, for passing a current through said resistance means during each half-cycle of a first polarity of said source potential, and

a second pair of diodes connected to and on each side of said resistance means, the resulting series combination of which is connected across said first switching means for passing a current through said resistance means during each half-cycle of a second polarity of said source potential when said first switching means is inactive, said second pair of diodes and said resistance means being shunted out of said circuit by said first switching means when the latter is activated.

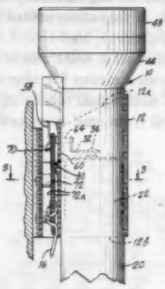
4,171,534
RECHARGEABLE FLASHLIGHT

Robert J. Strowe, Summerville, S.C., assignor to Streamlight, Inc., Norristown, Pa.

Continuation of Ser. No. 704,818, Jul. 13, 1976, abandoned. This application Mar. 21, 1978, Ser. No. 888,670
Int. Cl.[2] F21L *9/00*
U.S. Cl. 362—183 **9 Claims**

1. A rechargeable flashlight comprising a switch housing having an on/off switch contact therein for controlling operation of said flashlight, said housing including means for directly

connecting said switch contact to the charging contact of a battery charging circuit, in which said switch housing comprises a body portion and a slide portion, said switch contact



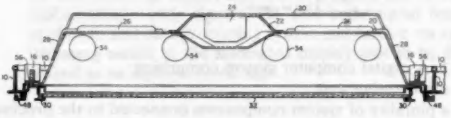
being carried by one of said switch housing portions, and in which said body and slide portions are spaced apart in parts thereof to define a channel therebetween for receiving said charging contact of said battery charging circuit.

4,171,535

LUMINAIRE FOR CONCEALED T CEILING SYSTEMS

Winfried N. Westermann, Vicksburg, Miss., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 28, 1977, Ser. No. 846,467
Int. Cl.[2] F21S *1/06*
U.S. Cl. 362—406 **6 Claims**



1. An asymmetrically mounted recessed lighting fixture for concealing the ceiling support framework in a suspended ceiling system, said lighting fixture comprising:

a top wall, a pair of sidewalls and a pair of end walls defining a bottom opening;

an appearance frame connected to the bottom edge of each of said sidewalls and said end walls constructed and arranged to underlie and conceal, at least in part, said ceiling support framework;

a framed refractor mounted within said bottom opening with the frame of said refractor being spaced a uniform distance from said appearance frame;

fluorescent lamp holders mounted to each of said end walls,

one of said end walls having an inwardly and horizontally directed portion defining a shelf to support one end of said recessed lighting fixture on said ceiling support framework and the other of said end walls being vertically planar; and

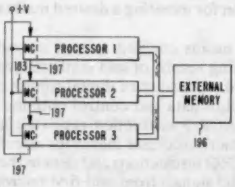
means associated with the other of said end walls adapted to coact with said ceiling support framework to support the other end of said recessed lighting fixture.

4,171,536

MICROPROCESSOR SYSTEM

Dale A. Heuer; Phillip C. Schloss, and Larry L. Schroeder, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 682,803, May 3, 1976. This application Dec. 5, 1977, Ser. No. 857,493
Int. Cl.[2] G06F *15/16*
U.S. Cl. 364—200 **8 Claims**



1. A data processing system comprising

a memory;

a plurality of memory accessing circuits each of which is interconnected with said memory and generates a memory access request when a memory access is required,

each of said memory accessing circuits including a shift register bit position;

means interconnecting said shift register bit positions of said plurality of memory accessing circuits to form a recirculating shift register containing a single active bit; and

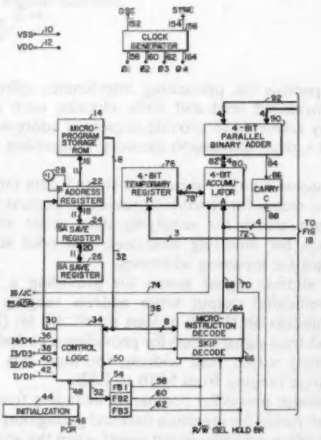
gating means respectively connected to said memory accessing circuits for permitting said memory to be accessed by one of said accessing circuits when a memory access request is present and said single active bit is resident in said shift register bit position associated with said one of said accessing circuits.

4,171,537

NUMBER ORIENTED PROCESSOR

Alan J. Weissberger, Santa Clara, and Ted W. Toal, Sunnyvale, both of Calif., assignors to National Semiconductor, Santa Clara, Calif.

Filed Jan. 9, 1978, Ser. No. 868,101
Int. Cl.[2] G06F *7/38, 15/06*
U.S. Cl. 364—704 **9 Claims**



1. A number processor for providing digit data and digit position and adapted to be coupled to and controlled by a first microprocessor means wherein said first microprocessor

means provides MACRO instructions, timing and control information directly to the control logic of said number processor in the form of digital signals to synchronize said number processor with said first microprocessor means, comprising:

a second microprocessor having fixed storage library read-only memory means separate from said first microprocessor means for providing a storage library permitting mathematical computations including at least arithmetic, trigonometric and logarithmic type computations;

data and MACRO instruction input means coupled to said second microprocessor and responsive to said control information for initiating a desired mathematical computation;

data output means coupled to said second microprocessor for providing results of said mathematical computation in the form of a plurality of digital signals representing digit position, digit data and control outputs;

data and MACRO instruction receiving means coupled to said first microprocessor means for directly receiving both said MACRO instructions and data in the form of a plurality of digital signals from said first microprocessor means; and

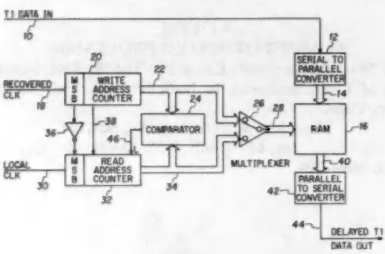
selection means coupled to said receiving means for selecting from said fixed storage library read-only memory means a specific portion of said storage library to execute the desired mathematical computation directly from said receiving means.

4,171,538

ELASTIC STORE SLIP CIRCUIT APPARATUS FOR PREVENTING READ AND WRITE OPERATIONS INTERFERENCE

Daniel R. Sheller, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 23, 1978, Ser. No. 871,652
Int. Cl.[2] G11C *7/00*; G06F *11/00, 13/00*
U.S. Cl. 364—900 **8 Claims**



1. Apparatus for preventing interference effects between nonsynchronized read and write circuits, each of which is cyclically activated to provide sequential addresses for application to a given addressable memory, comprising, in combination:

addressable memory means for storing data including data input means for receiving previously generated data, data output means for supplying data, write address input means for inputting addresses, and read address input means for inputting addresses;

write address signal means for providing a periodically incremented output write address ranging from most significant bit (MSB) to least significant bit (LSB);

read address signal means for providing a periodically incremented output read address, the logic bits of the read address ranging from MSB to LSB;

comparator means for comparing including first and second input means for inputting data and gating output means for providing a gating output signal when the address applied to said first input means approaches, closer than a predefined value, that supplied to said second input means;

means connecting said write address signal means to said write address input means of said memory means and to said first input means of said comparator means for supplying address signals thereto;

means connecting said read address signal means to said read address input means of said memory means and to said second input means of said comparator means for supplying address signals thereto; and

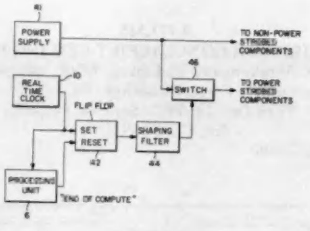
gating means connected to at least one of said signal means and to said comparator means for altering the MSB position of said one of said signal means upon receipt of said gating output signal from said comparator means.

4,171,539

POWER STROBED DIGITAL COMPUTER SYSTEM

David A. Tawfik, Fort Lee, and Martin W. Feintuch, Paramus, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 19, 1977, Ser. No. 861,592
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—900 **6 Claims**



1. A digital computer system comprising:

a processing unit;

a plurality of system components connected to the processing unit for applying computational variables thereto;

timing means for providing a signal which controls the computational cycle of the processing unit;

the processing unit providing a signal when its computational cycle has been completed;

a power supply for applying power to the system components;

certain of the system components requiring power only during the computational cycle of the processing unit; and

means for applying power to the certain system components only during the computational cycle of the processing unit including means connected to the timing means and to the processing unit for providing a signal in a first state in response to the signal provided by the timing means and for providing a signal in a second state in response to the signal provided by the processing unit, and means connected to the power supply and to the means connected to the timing means and to the processing unit, and responsive to the signal in the first state for applying power to the certain system components and responsive to the signal in the second state for interrupting power to said components.

4,171,540

APPARATUS FOR THE CONTROL OF INPUT DATA INTO A DATA PROCESSOR AND A DISPLAY DEVICE

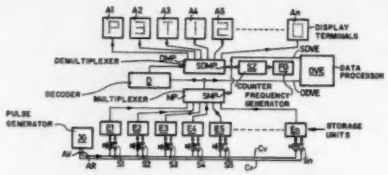
Werner F. Arnold, Nuremberg, Fed. Rep. of Germany, assignor to Firma DIEHL, Nuremberg, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,763

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1977, 2707208

Int. Cl.[2] G06F *1/04, 3/02, 3/14*

U.S. Cl. 364—900 19 Claims



1. An input mechanism for use with a data processing system, comprising:

a plurality of input buffer storage units including coding means for translating stored pulses into alpha-numeric code signals, said input buffer storage units having output terminals connected to input terminals of the data processing system;

decoding means connected to output terminals of said storage units;

a display device having a plurality of digital display terminals respectively connected with one of said input buffer storage units by means of said decoding means;

means connected to input terminals of said input buffer storage units for selecting any one of the plurality of storage units; and

pulse generating means including an electromechanical pulse generator with output terminals connected to input terminals of said selecting means, said pulse generating means being manually operable by an operating element for producing individual input pulses in response to movement of said operating element, each of said input pulses being applied to the one input buffer storage unit selected by said selecting means, and translated into one of said alpha-numeric code signals, the said code signal being applied to said data processing system and further via said decoding means to the associated display unit to be displayed as an alpha-numeric sign.

4,171,541

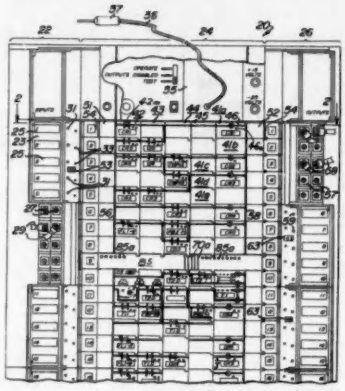
MODULAR PROGRAMMABLE CONTROLLING SYSTEM

Grover K. Houpt, Wayne, Pa., assignor to American Manufacturing Company, Inc., King of Prussia, Pa.

Filed Aug. 18, 1976, Ser. No. 715,414

Int. Cl.[2] G05B *19/02, 23/02*

U.S. Cl. 364—900 16 Claims



1. A system for controlling external utilization devices comprising:

(a) logic means which includes a plurality of subcircuits, said logic means having an input section thereto adapted to be coupled to external signalling apparatus and an output section adapted to be coupled to said utilization devices, and

(b) a plurality of passive modular means constructed to interchangeably and releasably engage said logic means, each modular means also being constructed when so engaged to cooperate with one or more of said subcircuits to thereby cause said subcircuit or subcircuits to perform a predetermined logic function, said modular means also bearing external indicia corresponding to said predetermined logical function.

DESIGN PATENTS

GRANTED OCT. 16, 1979

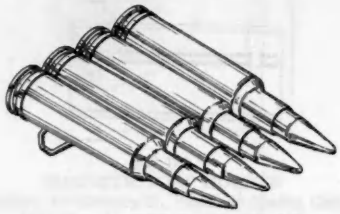
ERRATA

For CLASS	See PATENT NO.
D21–136	253,193

DESIGNS

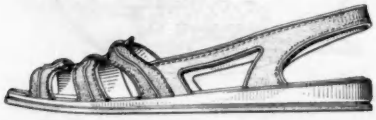
OCTOBER 16, 1979

253,136
CARTRIDGE BELT BUCKLE
Robert C. Lynch, No. 339, 2308 Land St., Laramie, Wyo. 82070
Filed Apr. 29, 1977, Ser. No. 792,483
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431



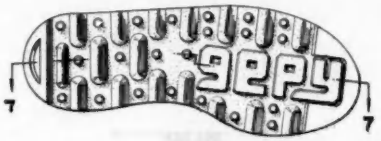
253,137
BOOT
Susan L. Foldes, Hazleton, Pa., assignor to Oggs Manufacturing Corp., Hazleton, Pa.
Filed Oct. 11, 1977, Ser. No. 841,328
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—274

253,138
SANDAL
Susan L. Foldes, Hazleton, Pa., assignor to Oggs Manufacturing Corp., Hazleton, Pa.
Filed Nov. 3, 1977, Ser. No. 848,072
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—297

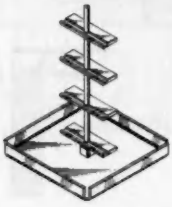


253,139
SANDAL
Susan L. Foldes, Hazleton, Pa., assignor to Oggs Manufacturing Corp., Hazleton, Pa.
Filed Nov. 3, 1977, Ser. No. 848,073
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—297

253,140
SHOE SOLE
Joseph Pasquier, Montfaucon, France, assignor to G E P, Saint Germain sur Moine, France
Filed Jul. 11, 1978, Ser. No. 923,926
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321



253,141
EYEGLASS FRAME SUPPORT RACK
Kenneth S. Gordon, 4320 Greer Rd., Woodland Hills, Calif. 91364
Filed Jul. 3, 1978, Ser. No. 921,867
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—23



253,142

OUTDOOR BENCH

Richard J. Herman, 4500 Lehigh Rd., College Park, Md. 20740

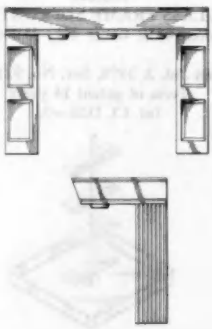
Filed Mar. 16, 1977, Ser. No. 778,277
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60

253,143

DISPLAY UNIT AND LIGHT FIXTURES THEREFOR

Jerry Shaw, 50 W. Fairlawn Blvd., and Samuel G. Solitt, 2121 Brookshire Rd., both of Akron, Ohio 44313

Filed Mar. 28, 1977, Ser. No. 781,653
Term of patent 14 years
Int. Cl. D20—*02*; D25—*02*
U.S. Cl. D6—85

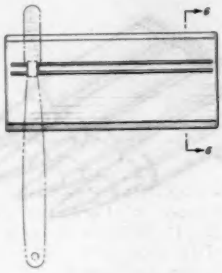


253,144

MAGNETIC HOLDER FOR OBJECTS

Naomi Heckler, 934 Embury St., Pacific Palisades, Calif. 90272

Filed Oct. 11, 1977, Ser. No. 841,151
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—86

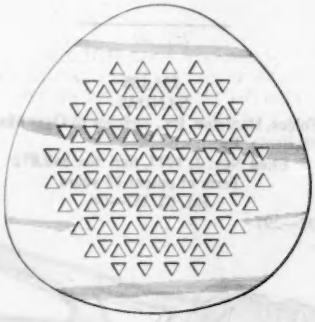


253,145

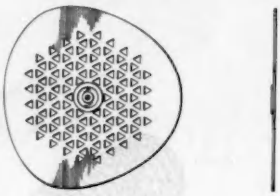
URINAL SCREEN

John M. Adam, 2404 Powers Ferry Rd., Marietta, Ga. 30062

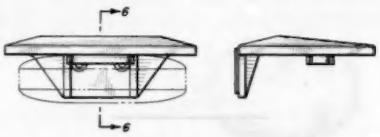
Filed Nov. 18, 1977, Ser. No. 852,937
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86



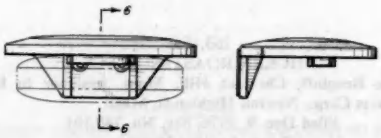
253,146
URINAL SCREEN
John M. Adam, 2404 Powers Ferry Rd., Marietta, Ga. 30062
Continuation-in-part of Ser. No. 852,937, Nov. 18, 1977. This application Oct. 12, 1978, Ser. No. 950,583
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86



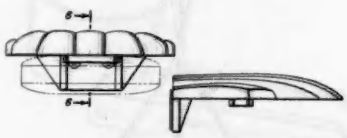
253,147
MAGNETIC SOAP HOLDER
Naomi Heckler, 934 Embury St., Pacific Palisades, Calif. 90272
Filed Oct. 11, 1977, Ser. No. 841,142
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90



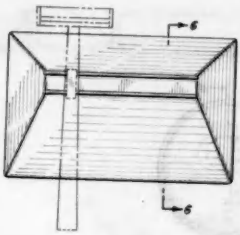
253,148
MAGNETIC SOAP HOLDER
Naomi Heckler, 934 Embury St., Pacific Palisades, Calif. 90272
Filed Oct. 11, 1977, Ser. No. 841,148
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90



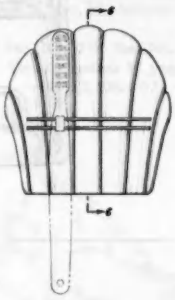
253,149
MAGNETIC SOAP HOLDER
Naomi Heckler, 934 Embury St., Pacific Palisades, Calif. 90272
Filed Oct. 11, 1977, Ser. No. 841,149
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90



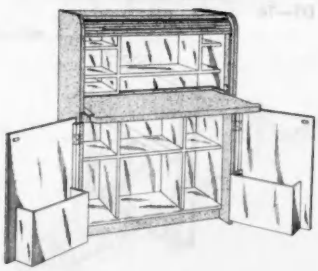
253,150
MAGNETIC HOLDER FOR OBJECTS
Naomi Heckler, 934 Embury St., Pacific Palisades, Calif. 90272
Filed Oct. 11, 1977, Ser. No. 841,147
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—86



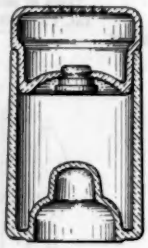
253,151
MAGNETIC HOLDER FOR OBJECTS
Naomi Heckler, 934 Embury St., Pacific Palisades, Calif. 90272
Filed Oct. 11, 1977, Ser. No. 841,152
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—86



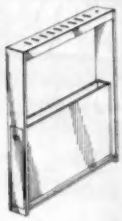
253,152
COMBINED DESK AND CABINET UNIT
France Berlic, 37-31 73rd St., Jackson Heights, N.Y. 11371
Filed Jun. 20, 1977, Ser. No. 808,370
Claims priority, application Yugoslavia, Dec. 27, 1976, 321/76
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—150



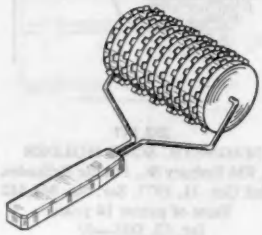
253,153
CONDIMENT CONTAINER
Inger M. Elliott, and Helena Uglow, both of New York, N.Y., assignors to China Seas, Inc., New York, N.Y.
Filed Feb. 24, 1977, Ser. No. 771,830
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—55



253,154
COMBINED KNIFE RACK AND STORAGE BIN
Robert R. Kriesten, and Margaret L. Kriesten, both of 1585 Singleton, Wichita Falls, Tex. 76302
Filed Aug. 4, 1977, Ser. No. 821,750
Term of patent 14 years
Int. Cl. D07—*07*
U.S. Cl. D7—74

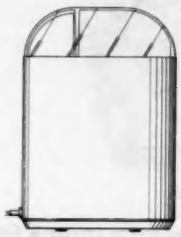


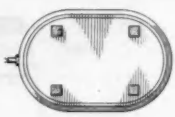
253,155
MEAT TENDERIZER
Vladslav J. Jurida, Toronto, Canada, assignor to Jurida Stamping & Mfg. Co. Ltd., Mississaugo, Canada
Filed Oct. 13, 1977, Ser. No. 841,960
Claims priority, application Canada, Sep. 20, 1977, 2009773
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—106



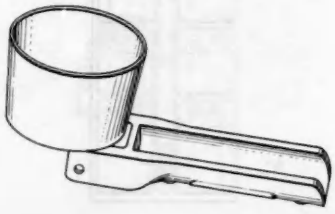
253,156
CHICKEN ROASTING RACK
Adelaide Bengloff, Chestnut Hill, Mass., assignor to Boval Products Corp., Newton Highlands, Mass.
Filed Dec. 9, 1976, Ser. No. 749,101
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—130

253,157
FOOD GRINDER
Robert Dziekonski, Fort Lee, N.J., assignor to Salton, Inc., Bronx, N.Y.
Filed Jun. 16, 1977, Ser. No. 807,035
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—155

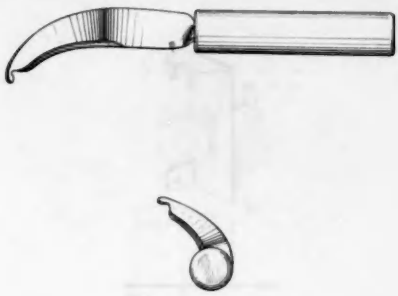




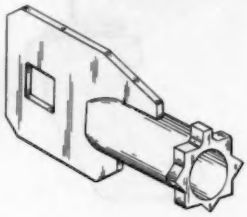
253,158
PICKUP SCOOP FOR CLEANING SWIMMING POOLS
Andrew L. Pansini, 200 Golden Gate Ave., Belvedere, Calif. 94920
Filed Oct. 26, 1977, Ser. No. 845,574
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—161



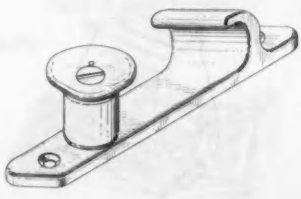
253,159
WEED REMOVING TOOL
Joseph F. Crisafulli, Box 1051, Glendive, Mont. 59330
Filed Dec. 14, 1977, Ser. No. 860,483
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—12



253,160
KEY BLANK FOR AN AXIAL TUMBLER-TYPE LOCK
Robert L. Steinbach, Chicago, Ill., assignor to Chicago Lock Co., Chicago, Ill.
Filed Jan. 16, 1978, Ser. No. 869,868
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—347

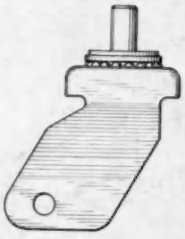


253,161
ROLLER CHOCK
John Lindsay, 16 Harbor St., Manchester, Mass. 01944
Filed Feb. 21, 1978, Ser. No. 879,816
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

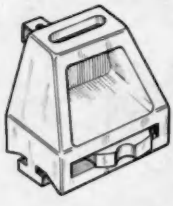


253,162
CURTAIN ROD BRACKET
Maurice J. Sheehan, Ocean Bluff, Mass., assignor to Edward F. McBride, a part interest
Filed Nov. 10, 1977, Ser. No. 850,705
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—366

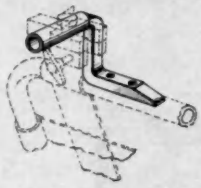
253,163
CASTER FRAME
Ward R. Goff, Kalamazoo, Mich., assignor to Goff Products Corporation
Filed May 8, 1978, Ser. No. 904,003
Term of patent 14 years
Int. Cl. D8—*08, 09*
U.S. Cl. D8—375



253,164
TIE-DOWN BRACKET
Charles E. Ingram, 13703 Hendrick, Warren, Mich. 48089
Filed Sep. 29, 1977, Ser. No. 837,598
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382

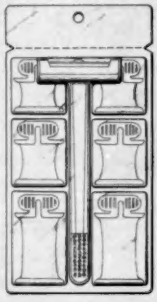


253,165
UMBRELLA CLAMP MOUNTING BRACKET
Norman D. Scott, Rte. 2, Box 409, Daytona Beach, Fla. 32019
Filed Oct. 31, 1977, Ser. No. 847,030
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—396



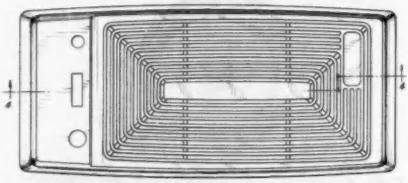
253,166
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jun. 27, 1977, Ser. No. 810,662
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—129

253,167
TOILETRY BLISTER PACKAGE
Erick-Pierre Fournier, and Ethel V. Hill, both of 30 Park Ave., New York, N.Y. 10016
Filed Jul. 25, 1977, Ser. No. 818,982
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185

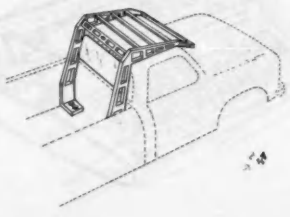


253,168
PACKAGING CONTAINER
Kjell Nilsson, Staffanstorp; Bertil T. Nilsson, Åkarp; Nils T. Hammarlund, Dalby, and Rolf U. Andersson, Lund, all of Sweden, assignors to AB Akerlund & Rausing
Filed Mar. 9, 1977, Ser. No. 776,008
Claims priority, application Sweden, Sep. 10, 1976, 1761
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

253,169
HOUSING FOR A FIRE AND SMOKE DETECTOR
Frederick J. Conforti, Aurora, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed Jan. 9, 1978, Ser. No. 868,126
Term of patent 7 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

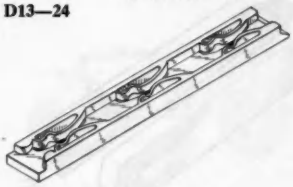


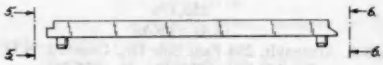
253,170
COMBINED PICKUP CAB CARRIER AND ROLL BAR
Robert Ramirez, 3003 Douglas St., Dallas, Tex. 75219
Filed Oct. 12, 1977, Ser. No. 841,537
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



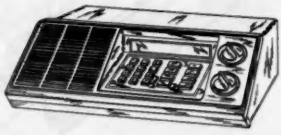
253,171
INSULATOR FOR ELECTRIC HEATING ELEMENTS
Bruce C. Harris, and Robert V. Ogrodnik, both of Wytheville, Va., assignors to Emerson Electric Co., St. Louis, Mo.
Filed May 16, 1977, Ser. No. 797,592
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17

253,172
PRINTED CIRCUIT CARD GUIDE
Milton I. Ross, 400 College Ave., Haverford, Pa. 19041
Filed Dec. 8, 1977, Ser. No. 858,723
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—24

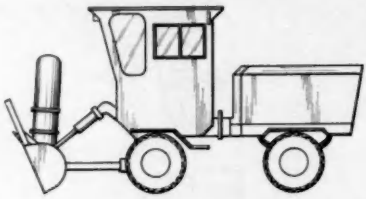




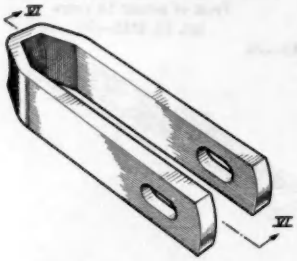
253,173
SCANNING MONITOR RADIO RECEIVER
John C. Coons, Cincinnati, Ohio, assignor to Masco Corporation of Indiana
Filed Jun. 20, 1977, Ser. No. 808,270
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—72



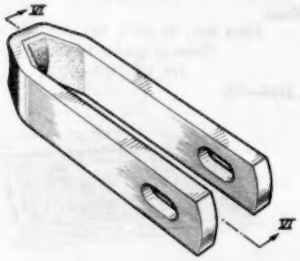
253,174
ARTICULATED SNOW BLOWER
Howard E. Mason, 808 S. School St., Lodi, Calif. 95240
Filed Feb. 14, 1977, Ser. No. 768,635
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D15—12



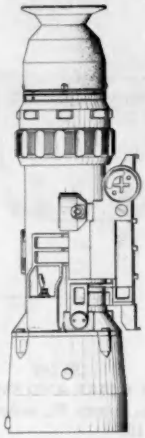
253,175
LUG STRAP
Joseph A. Arsenault, 254 East Side Dr., Concord, N.H. 03301
Filed Feb. 6, 1976, Ser. No. 655,766
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—78

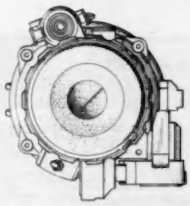


253,176
LUG STRAP
Joseph A. Arsenault, 254 East Side Dr., Concord, N.H. 03301
Filed Feb. 6, 1976, Ser. No. 655,785
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—78



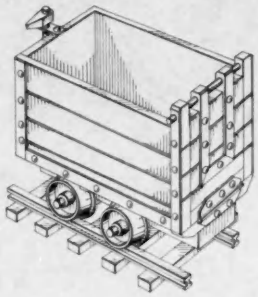
253,177
NIGHT VISION SCOPE
Alan Litman, Pittsburgh, Pa., assignor to Smith & Wesson Chemical Company, Inc., Pittsburgh, Pa.
Filed Sep. 16, 1977, Ser. No. 833,936
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—48



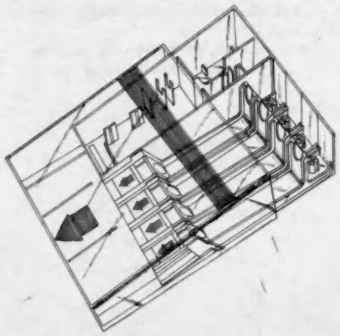


253,178
TYPEWRITER
Robert Osit, Audubon, Pa., assignor to SCM Corporation, New York, N.Y.
Filed Sep. 6, 1977, Ser. No. 830,734
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

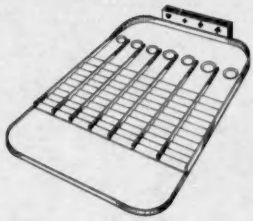
253,179
HOLDER FOR SMALL STATIONARY ITEMS OR THE LIKE
Ralph E. Bosler, 4149 W. Port au Prince, Phoenix, Ariz. 85023
Filed Jul. 25, 1977, Ser. No. 818,465
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—82



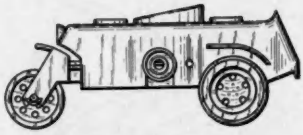
253,180
COMBINED DRAFTING PEN HOLDER AND CONTAINER
Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.
Filed Jun. 30, 1977, Ser. No. 811,930
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—85



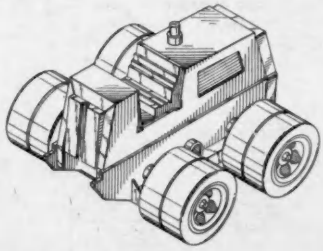
253,181
SOLITAIRE CARD GAME BOARD
Thomas K. Marbury, 227 Harrill St., Forest City, N.C. 28043
Filed May 3, 1978, Ser. No. 902,775
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—57



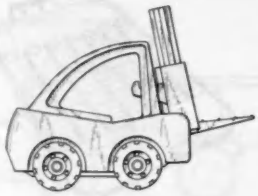
253,182
TOY VEHICLE
Michael I. Satten, Great Neck Estates, N.Y., assignor to Child Guidance Playthings, Inc., New York, N.Y.
Filed Dec. 27, 1977, Ser. No. 864,646
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—80



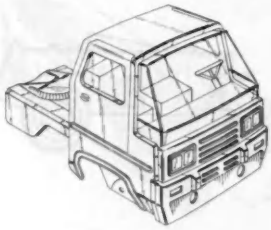
253,183
TOY TRACTOR
Vernon A. Peterson, Minneapolis, Minn., assignor to Tonka Corporation, Spring Park, Minn.
Filed Jan. 19, 1978, Ser. No. 870,934
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—132



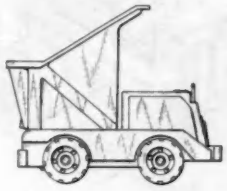
253,184
TOY FORK LIFT
Victor J. Fratarcangeli, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 9, 1977, Ser. No. 859,122
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134



253,185
TOY TRUCK CAB
Royce D. Rumsey, Hopkins, Minn., assignor to Tonka Corporation, Spring Park, Minn.
Continuation of Ser. No. 650,518, Jan. 19, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,038
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134



253,186
TOY TRUCK
Victor J. Fratarcangeli, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 23, 1977, Ser. No. 854,131
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—135



253,187
COMBINED SHOWER HEAD AND SOAP DISPENSER FOR ANIMALS
Karl R. Stucky, 4728 N. 10th St., Phoenix, Ariz. 85014
Filed May 16, 1977, Ser. No. 797,576
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

253,188
SPLASHGUARD FOR BATHING ENCLOSURES
Doyle M. Baugus, 4609 Crestfield Dr., Knoxville, Tenn. 37921
Filed Feb. 21, 1978, Ser. No. 879,698
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

253,189
WOOD STOVE
Peter A. Latham, Newburyport, and Paul E. Brefka, Southborough, both of Mass., assignors to Energy Harvesters Corp., Fitzwilliam, N.H.
Filed Dec. 30, 1977, Ser. No. 865,906
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

253,190

BLOOD CELL SEPARATOR

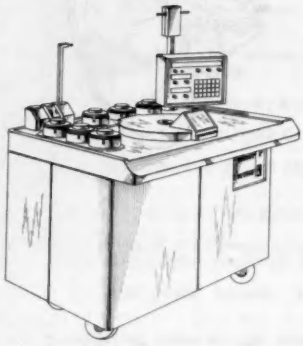
Loring C. Bixler, Vestal, and Ernest Wittner, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1977, Ser. No. 839,155

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—1.1



253,191

DENTAL MATRIX BAND

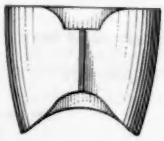
Marvin M. Stark, Los Altos Hills, Calif., and Hans C. von Weissenfluh, Gentilino, Switzerland, assignors to Marvin M. Stark Research Foundation, Santa Clara, Calif.

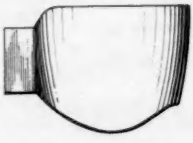
Filed Oct. 31, 1977, Ser. No. 847,306

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—10





253,192

PIVOT POLE DOOR

Michael Lax, New York, N.Y., assignor to Powers-Fiat

Filed Aug. 30, 1971, Ser. No. 176,441

The portion of the term of this patent subsequent to Jun. 16, 1989, has been disclaimed.

Term of patent 14 years

Int. Cl. D25—*02*

U.S. Cl. D25—48

253,193

TOY VEHICLE

Ronald R. Pauly, Mound, and Royce D. Rumsey, Hopkins, both of Minn., assignors to Tonka Corporation, Spring Park, Minn.

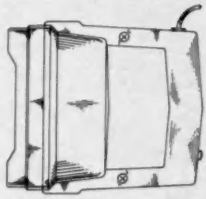
Filed May 9, 1977, Ser. No. 795,002

Term of patent 14 years

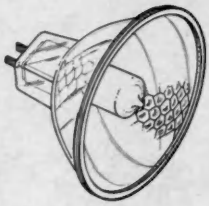
Int. Cl. D21—*01*

U.S. Cl. D21—136

253,194
PORTABLE SPOT LIGHT
Jerry O. Watley, 504 W. 13th St., Cassville, Mo. 65625
Filed Sep. 16, 1976, Ser. No. 723,672
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20 K



253,195
PROJECTION LAMP
Charles E. Henkel, and Arnold E. Westlund, Jr., both of Winchester, Ky., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed May 13, 1977, Ser. No. 796,572
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF OCTOBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co., Inc.: *See*—
Clark, Robert C., 4,171,013, Cl. 160-22.000.

Aalbers, Johan G.: *See*—
Dorrepaal, Wim; van den Haak, Gerardus M.; Weehuizen, Joseph M.; and Aalbers, Johan G., 4,171,261, Cl. 209-166.000.

AB Gustavsberg: *See*—
Soderlund, Bengt, 4,171,150, Cl. 312-107.000.

Abblard, Jean; and Baudoin, Michel, to Philagro. Process for producing N-substituted amides. 4,171,302, Cl. 260-239.00A.

Abbott, John A.: *See*—
Roberts, Thomas E., Jr.; Wright, Bruce M.; Watson, Clyde D.; and Abbott, John A., 4,171,263, Cl. 210-8.000.

Abbott Laboratories: *See*—
Schwenzer, Kathryn S.; and Magic, Susan E., 4,171,204, Cl. 23-230.00B.
Winn, Martin; and Nordeen, Carl W., 4,171,367, Cl. 424-273.00P.

Abrams, Martin: *See*—
Nitschneider, Robert M.; Sargis, John R.; and Abrams, Martin, 4,171,121, Cl. 254-28.000.

Abt, Reinhold: *See*—
Katz, Klaus; Pfundstein, Wolfgang; and Abt, Reinhold, 4,170,925, Cl. 91-400.000.

Achini, Roland; Oppolzer, Wolfgang; and Pfenninger, Emil, to Sandoz Ltd. Hydro-4-phenyl-benz[f]isoindoline compounds. 4,171,369, Cl. 424-274.000.

Achrekar, Prakash M. Roller coaster assembly. 4,170,943, Cl. 104-56.000.

Adachi, Tadao: *See*—
Tanaka, Ryoichi; and Adachi, Tadao, 4,171,054, Cl. 414-687.000.

Adam, Milton F., to United States of America, Energy. Method and means of packaging nuclear fuel rods for handling. 4,170,817, Cl. 29-450.000.

Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; Sinha, Ashok K.; and Wang, David N., to Bell Telephone Laboratories, Incorporated. Radiation mask structure. 4,171,489, Cl. 250-510.000.

Adamson, John S., to Chevron Research Company. Transponder system including an oscillator/ripple counter controlling a fixed gray code logic network in circuit with a driver/gate circuit for generating "red-alert" end condition digital signals in a storage tank gauging system. 4,171,520, Cl. 340-152.00T.

Adolphi, Heinrich: *See*—
Theobald, Hans; Adolphi, Heinrich; and Eicken, Karl, 4,171,357, Cl. 424-224.000.

Advance Transformer Co.: *See*—
Rayno, Glenn D., 4,170,812, Cl. 29-25.420.

AES Technology Systems, Inc.: *See*—
Nitschneider, Robert M.; Sargis, John R.; and Abrams, Martin, 4,171,121, Cl. 254-28.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Authier, Bernard F., 4,170,985, Cl. 126-424.000.

AGFA-Gevaert, A.G.: *See*—
Odenwalder, Heinrich; Puschel, Walter; and Ranz, Erwin, 4,171,223, Cl. 96-76.00R.
Vetter, Hans; Puschel, Walter; and Marx, Paul, 4,171,220, Cl. 96-29.00D.

AGFA-GEVAERT N.V.: *See*—
Verhille, Karel E.; Biermans, Paul V.; and Van Keilegom, Roland, 4,171,224, Cl. 96-94.00R.

Aguirre, Alfred A.: *See*—
Jimenez, James A.; Aguirre, Alfred A.; and Reyes, Apolonio, 4,171,198, Cl. 425-377.000.

Aigo, Seiichiro. Apparatus for bump-plating semiconductor wafers. 4,170,959, Cl. 118-627.000.

Air Products and Chemicals, Inc.: *See*—
Bartish, Charles M., 4,171,461, Cl. 568-902.000.
Sircar, Shivaji, 4,171,206, Cl. 55-26.000.
Sircar, Shivaji, 4,171,207, Cl. 55-26.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Yamanaka, Minoru; and Kawabata, Yasuhiro, 4,170,971, Cl. 123-119.00A.

Aizu, Shoichi; and Shimizu, Masami, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Slinger arrangement for use with bearing of supercharger. 4,171,137, Cl. 277-25.000.

Aka, Peter: *See*—
Birkenfeld, Richard; Thun, Werner; and Aka, Peter, 4,171,178, Cl. 414-45.000.
Birkenfeld, Richard; Aka, Peter; and Lange, Hellmuth, 4,171,179, Cl. 414-85.000.

Akzona, Inc.: *See*—
Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., 4,171,402, Cl. 428-369.000.

Albright, Harold J.: *See*—
Anderson, Donald F.; and Albright, Harold J., 4,171,188, Cl. 417-282.000.

Alcolac Inc.: *See*—
Linder, Seymour M., 4,171,457, Cl. 568-674.000.

Allen, David O.; and Wombold, Harry A. E., to Buckeye Molding Company. Container having closure fastening means. 4,171,062, Cl. 220-270.000.

Allen, Kenneth R.; Digby, Dennis; and Coombes, Alan, to Biotronik Mess- und Therapiegerate GmbH & Co. Demand pacer having reduced recovery time. 4,170,999, Cl. 128-419.0PG.

Allen, Richard A.: *See*—
Denner, John A., Jr.; and Allen, Richard A., 4,171,518, Cl. 331-94.50G.

Allen, Richard E.; and Segatto, Peter R., to Corning Glass Works. Magnetic recording and storage device having high abrasion resistance and method. 4,171,388, Cl. 427-129.000.

Allen, Richard E.; and Segatto, Peter R., to Corning Glass Works. Magnetic recording and storage device having high abrasion resistance and method. 4,171,399, Cl. 428-336.000.

Allied Chemical Corporation: *See*—
Bernales, Cicero A.; and Michener, Aubrey W., 4,171,348, Cl. 423-570.000.
Burroughs, Harold R.; Martin, Willie E.; and Jordan, Vernon J., 4,171,061, Cl. 220-256.000.
Lazarus, Stanley D.; Chakravarti, Kalidas; Rowan, Hugh H.; and Neal, James G., 4,171,422, Cl. 528-437.000.
Mares, Frank; Jacobson, Stephen E.; and Tang, Reginald T., 4,171,313, Cl. 260-343.000.
Mason, Charles D., 4,171,338, Cl. 264-211.000.

Alton Box Board Company: *See*—
Bonczyk, Bruno C., 4,171,046, Cl. 206-193.000.

Aluminium Pechiney: *See*—
Lamerant, Jean M.; Cohen, Joseph; and Maurel, Pierre, 4,171,205, Cl. 23-296.000.

Aluminum Company of America: *See*—
King, Larry K.; and Hardwick, Roy E., 4,171,346, Cl. 423-496.000.

Alvarez, Marcial. Sliding I.V. needle carrier assembly. 4,170,993, Cl. 128-214.00R.

Amada Company, Limited: *See*—
Sato, Masao, 4,170,915, Cl. 83-800.000.

American Air Filter Company, Inc.: *See*—
Carter, Albert B., 4,171,211, Cl. 55-493.000.
Miller, Jerry D., 4,171,210, Cl. 55-481.000.

American Cyanamid Company: *See*—
Barua, Girish C.; and Nagy, Daniel E., 4,171,418, Cl. 526-287.000.

American Greetings Corporation: *See*—
Flinn, Robert W.; and Robinson, Roy D., 4,170,860, Cl. 53-170.000.

American Manufacturing Company, Inc.: *See*—
Houpt, Grover K., 4,171,541, Cl. 364-900.000.

Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenther; and Greiner, Hans-Joachim, to Siemens Aktiengeselleschaft. X-ray diagnostic generator in which the X-ray tube voltage is regulated via the X-ray tube current. 4,171,487, Cl. 250-408.000.

Anand, Satish: *See*—
Lang, Udo; Gruber, Franz; Anand, Satish; and Lehmer, Wilhelm, 4,170,881, Cl. 62-538.000.

Anderson, Donald F.; and Albright, Harold J., to Chicago Pneumatic Tool Company. Rotary air compressors with intake valve control and lubrication system. 4,171,188, Cl. 417-282.000.

Anderson, John N.: *See*—
Bohm, Georg G. A.; and Anderson, John N., 4,171,237, Cl. 156-115.000.

Andreassen, Knut A.: *See*—
Harang, Hakon; Widding, Karl; Andreassen, Knut A.; and Holte, Johan B., 4,171,247, Cl. 204-34.000.

Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, to Henkel Kommanditgesellschaft auf Aktien. Surface-active compound combination containing hydroxyalkylamines. 4,171,278, Cl. 252-102.000.

Angelova, Emilia I.: *See*—
Toshev, Vassil S.; Patov, Yordan G.; and Angelova, Emilia I., 4,171,345, Cl. 423-450.000.

Anselmo, Victor J.; and Reilly, Terrence H., to California Institute of Technology. Medical diagnosis system and method with multispectral imaging. 4,170,987, Cl. 128-665.000.

Aono, Shigeo, to Nissan Motor Company, Limited. Compensation for inherent fluctuation in output level of exhaust sensor in air-fuel ratio control system for internal combustion engine. 4,170,965, Cl. 123-32.0EE.

Aoyama, Syunichi, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,170,972, Cl. 123-119.00A.

Appleford, David E.: *See—*
Faulkner, Keith; and Appleford, David E., 4,171,067, Cl. 222-1.000.

Applequist, Roy E., to Great Plains Manufacturing Incorporated. Foldable construction for agricultural implements. 4,171,022, Cl. 172-311.000.

Araps, Constance J., to International Diagnostics Tech. Inc. Imides of thyroxin and triiodothyronine. 4,171,311, Cl. 260-326.340.

Arenco Aktiebolag: *See—*
Pettersson, Viktor E., 4,170,806, Cl. 17-63.000.

Argus Chemical Corporation: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, 4,171,298, Cl. 260-45.85H.

Armstrong Cork Company: *See—*
Fantazier, Richard M., 4,171,252, Cl. 204-159.230.

Arnold, Werner F., to DIEHL, Firma. Apparatus for the control of input data into a data processor and a display device. 4,171,540, Cl. 364-900.000.

Aronoff, Michael I.: *See—*
Flygstad, Dean W.; and Aronoff, Michael I., 4,171,082, Cl. 226-196.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Jyojiki, Masao; and Nakamura, Kazuo, 4,171,155, Cl. 354-25.000.

Asano, Masaharu, to Nissan Motor Company, Limited. Air fuel mixture control apparatus for internal combustion engines. 4,170,969, Cl. 123-32.0EE.

Aschenbrenner, Frank A.; and Wright, William V. Process and apparatus for producing open-end spun yarn. 4,170,866, Cl. 57-58.950.

Ashkin, Peter B.: *See—*
Tobey, Morley C., Jr.; Giuliani, David J.; and Ashkin, Peter B., 4,170,818, Cl. 29-571.000.

Asphahani, Aziz I.; Hodge, F. Galen; Leonard, Robert B.; and Schuur, Patrick D., to Cabot Corporation. Corrosion-resistant nickel alloy. 4,171,217, Cl. 75-122.000.

Asselin, Andre A.; and Humber, Leslie G., to Ayerst, McKenna & Harrison Limited. 10b-Azafluoranthene derivatives and precursors thereof. 4,171,443, Cl. 546-66.000.

Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,171,175, Cl. 405-170.000.

Atlantic Research Corporation: *See—*
Scheffee, Robert S., 4,170,984, Cl. 126-432.000.

Atlantic Richfield Company: *See—*
Kesling, Haven S., Jr.; and Zehner, Lee R., 4,171,450, Cl. 560-204.000.
Pedersen, S. Erik, 4,171,316, Cl. 260-346.750.

Ato Chimie: *See—*
Legrix, Georges; Junca, Gerard; Bouron, Michel; and Rustul, Pierre, 4,171,401, Cl. 428-369.000.

Authier, Bernard F., to Agence Nationale de Valorisation de la Recherche (ANVAR). Solar energy collector. 4,170,985, Cl. 126-424.000.

Avco Corporation: *See—*
Denner, John A., Jr.; and Allen, Richard A., 4,171,518, Cl. 331-94.50G.
Milo, George T., 4,170,873, Cl. 60-39.080.

Ayers, Peter T.: *See—*
Ayers, Thomas A.; and Ayers, Peter T., 4,170,911, Cl. 83-104.000.

Ayers, Thomas A.; and Ayers, Peter T., to Forest Products Industrial Designs, Inc. Log cutting apparatus. 4,170,911, Cl. 83-104.000.

Ayerst, McKenna & Harrison Limited: *See—*
Asselin, Andre A.; and Humber, Leslie G., 4,171,443, Cl. 546-66.000.

B. F. Goodrich Company, The: *See—*
Plaat, Cornelius L., 4,171,036, Cl. 188-196.00R.

Babcock, Clarence O. Displacement measuring sensor. 4,170,897, Cl. 73-778.000.

Bacciarelli, Sergio: *See—*
Bornengo, Mario; Bacciarelli, Sergio; and Serdi, Sergio, 4,171,321, Cl. 260-455.00A.

Bacel, Peter N.: *See—*
Donley, Samuel W.; and Bacel, Peter N., 4,171,393, Cl. 427-354.000.

Back, Gerhard: *See—*
Donath, Peter; and Back, Gerhard, 4,171,300, Cl. 260-145.00B.

Badberg, Melvin C.; and Olsen, Roy W., to Goodyear Tire & Rubber Company, The. Mandrel assembly for vulcanizing a vent tube within the bore of a filler neck hose having a complex multi-curved configuration. 4,171,118, Cl. 249-183.000.

Bailitis, Eduard, to Kernforschungsanlage Julich GmbH. Method of and apparatus for the analysis of gases. 4,170,892, Cl. 73-23.000.

Bain, Benjamin H., Jr., to General Electric Company. Iron with mode valve. 4,170,835, Cl. 38-77.500.

Baird, James E.: *See—*
Baird, Robert A.; and Baird, James E., 4,170,813, Cl. 29-281.300.

Baird, Robert A.; and Baird, James E., to J. O. & R. H. Baird Limited. Clamp for strapping ingot moulds. 4,170,813, Cl. 29-281.300.

Balasubramanyan, Sugavanam; and Shephard, Margaret C., to Imperial Chemical Industries Limited. Pyrazine-2-ylmethyl-ketones and their fungicidal use. 4,171,214, Cl. 71-92.000.

Balcke-Durr Aktiengesellschaft: *See—*
Reiter, Paul, 4,171,334, Cl. 261-112.000.

Balint, Nikolaus K., to Standard Oil Company (Indiana). Catalyst system. 4,171,284, Cl. 252-429.00B.

Ballweber, Edward G.: *See—*
Connelly, Lawrence J.; and Ballweber, Edward G., 4,171,296, Cl. 260-29.6WQ.

Ban, Masuo: *See—*
Ishida, Takuo; and Ban, Masuo, 4,171,108, Cl. 242-84.20G.

Baram, Martin, to Reinebar AG. Method of manufacturing a centrifuge rotor. 4,170,814, Cl. 29-452.000.

Baranov, Mikhail I., to Kharkovsky Politekhnichesky Institut. Inductor for working metals by pressure of pulsating magnetic field. 4,170,887, Cl. 72-56.000.

Barnsdale, Timothy J. R. Screw thread cutting member. 4,171,177, Cl. 408-218.000.

Barthe, Marie-Pierre: *See—*
Battigelli, Jean A.; and Barthe, Marie-Pierre, 4,171,265, Cl. 210-56.000.

Bartish, Charles M., to Air Products and Chemicals, Inc. Synthesis of ethanol by homologation of methanol. 4,171,461, Cl. 568-902.000.

Barua, Girish C.; and Nagy, Daniel E., to American Cyanamid Company. Cationic and amphoteric surfactants. 4,171,418, Cl. 526-287.000.

BASF Aktiengesellschaft: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; Platz, Rolf; Magnussen, Peter; and Weiss, Franz-Josef, 4,171,451, Cl. 560-204.000.
Schuster, Ludwig; Hickmann, Eckhard; and Halbritter, Klaus, 4,171,458, Cl. 568-735.000.
Schuster, Ludwig; and Seid, Bernhard, 4,171,459, Cl. 568-735.000.
Theobald, Hans; Adolphi, Heinrich; and Eicken, Karl, 4,171,357, Cl. 424-224.000.

Bassinger, Grey, to Technical Drilling Tools, Inc. Hydraulic shock absorbing method. 4,171,025, Cl. 175-65.000.

Battigelli, Jean A.; and Barthe, Marie-Pierre, to Saint-Gobain Industries. Suppression of pollution in mineral fiber manufacture. 4,171,265, Cl. 210-56.000.

Baudoin, Michel: *See—*
Abblard, Jean; and Baudoin, Michel, 4,171,302, Cl. 260-239.00A.

Bauer, Egon A. J.: *See—*
Dits, Herbert R.; and Bauer, Egon A. J., 4,170,876, Cl. 60-547.00R.

Bauer, Peter W., to United States of America, Navy. Event mark decoder for use with time code generator. 4,171,526, Cl. 346-23.000.

Bauers, Gerald T.: *See—*
Jehn, Thomas C.; Roraff, Francis J.; and Bauers, Gerald T., 4,170,964, Cl. 122-235.00G.

Bauhutte Leitl-Werke Rieger-Anlagentechnik GmbH: *See—*
Rieger, Walter, 4,170,857, Cl. 52-513.000.

Baumgart, Frank; Bensmann, Gunter; Haasters, Jorg; Hartwig, Jurgen; Jorde, Joachim; Muller, Manfred; and Schlegel, Karl F., to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for implanting and subsequently removing mechanical connecting elements from living tissue. 4,170,990, Cl. 128-92.00B.

Bautex Adolf Stover KG: *See—*
Hugin, Hans, 4,171,473, Cl. 200-47.000.

Baxter Travenol Laboratories, Inc.: *See—*
Winchell, David A.; and Fowles, Thomas A., 4,171,236, Cl. 156-69.000.

Bayer Aktiengesellschaft: *See—*
Beck, Gunther; and Heitzer, Helmut, 4,171,442, Cl. 544-334.000.
Dhein, Rolf; Hohlein, Peter; Kuchenmeister, Rolf; and Beer, Wolfgang, 4,171,294, Cl. 260-22.0CQ.
Meyer, Frank; Kubens, Rolf; and Winkelmann, Martin, 4,171,419, Cl. 528-67.000.

Beale, Julian R. A., to U.S. Philips Corporation. Vehicle propulsion system with inertial storage. 4,171,029, Cl. 180-54.00R.

Beasley, Marion W.; Carroll, Harlan L.; and Brooking, Hurley R., to Sonoco Products Company. Apparatus for fabricating and assembling multi-cell partitions. 4,170,928, Cl. 93-37.00R.

Beck, Gunther; and Heitzer, Helmut, to Bayer Aktiengesellschaft. Process for the preparation of 2,4,5-trichloropyrimidine. 4,171,442, Cl. 544-334.000.

Becker, Karl-Heinz: *See—*
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,171,370, Cl. 424-282.000.

Beckley-Cardy Company: *See—*
Carver, George E.; and Sindelar, Joseph C., 4,171,116, Cl. 248-464.000.

Beckwith, Carl M.: *See—*
Malvick, Arnold O.; MacDonald, Wayne W.; and Beckwith, Carl M., 4,171,158, Cl. 356-239.000.

Bedard, Alfred J., Jr.: *See—*
Fujita, Tetsuya T.; and Bedard, Alfred J., Jr., 4,170,899, Cl. 73-189.000.

Beer, Wolfgang: *See—*
Dhein, Rolf; Hohlein, Peter; Kuchenmeister, Rolf; and Beer, Wolfgang, 4,171,294, Cl. 260-22.0CQ.

Beliot Corporation: *See—*
Crouse, Jere W., 4,171,106, Cl. 242-66.000.

Bell & Howell Company: *See—*
Hawn, Robert D., 4,171,110, Cl. 242-192.000.

Bell Telephone Laboratories, Incorporated: *See—*
Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; Sinha, Ashok K.; and Wang, David N., 4,171,489, Cl. 250-510.000.
Carbrey, Robert L., 4,171,466, Cl. 179-15.0BY.
Evenchik, Leonard N., 4,171,467, Cl. 179-15.0BM.
Guggenheim, Howard J., 4,171,344, Cl. 423-364.000.
Gyorgy, Ernst M.; LeCraw, Roy C.; and Wolfe, Raymond, 4,171,389, Cl. 427-130.000.

Belugin, Vadim F.: *See*—
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.

Ben Gurion University of the Negev: *See*—
Loeb, Sidney, 4,171,409, Cl. 429-17.000.

Bendix Corporation, The: *See*—
Tawfik, David A.; and Feintuch, Martin W., 4,171,539, Cl. 364-900.000.

Benedek, Gyorgy; Bese, Andras; Domokos, Jozsef; and Kovacs, Istvan, to Hajtomuvek es Festoberendezesek Gyara. Electrostatic paint spraying apparatus. 4,171,100, Cl. 239-700.000.

Bensmann, Gunter: *See*—
Baumgart, Frank; Bensmann, Gunter; Haasters, Jorg; Hartwig, Jurgen; Jorde, Joachim; Muller, Manfred; and Schlegel, Karl F., 4,170,990, Cl. 128-92.00B.

Benson, Arnold M.; Heath, James E.; and Matovich, Mark A., to Shell Oil Company. Method for continuously separating emulsions. 4,171,264, Cl. 210-40.000.

Berg, Markus: *See*—
Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, 4,171,278, Cl. 252-102.000.

Berges, David A., to SmithKline Corporation. 7-Acylamino-3-(sulfaminoalkyl substituted tetrazolylthiomethyl)cephalosporins antibacterial compositions containing them and methods of treating bacterial infections with them. 4,171,362, Cl. 424-246.000.

Berges, David A., to SmithKline Corporation. 7-Acylamino-3-(sulfaminoalkyl substituted tetrazolylthiomethyl)cephalosporins, antibacterial compositions containing them and methods of treating bacterial infections with them. 4,171,368, Cl. 424-246.000.

Berges, David A., to SmithKline Corporation. 7-Amino-3-(sulfaminoalkyl substituted tetrazolylthiomethyl)cephalosporin intermediates for preparing 7-acylamino cephalosporins. 4,171,433, Cl. 544-26.000.

Bergwerksverband GmbH: *See*—
Meyer, Frank; Kubens, Rolf; and Winkelmann, Martin, 4,171,419, Cl. 528-67.000.

Bernales, Cicero A.; and Michener, Aubrey W., to Allied Chemical Corporation. Process for eliminating carbon deposition on sulfur dioxide reduction catalyst in a staged reactor system. 4,171,348, Cl. 423-570.000.

Berner, Godwin: *See*—
Habermeier, Jurgen; and Berner, Godwin, 4,171,424, Cl. 528-292.000.

Beschke, Helmut; Friedrich, Heinz; and Kleeman, Axel, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of substituted pyridine (C). 4,171,444, Cl. 546-250.000.

Beschke, Helmut; Friedrich, Heinz; and Schreyer, Gerd, to Deutsche Gold- und Siber-Scheideanstalt vormals Roessler. Process for the production of pyridine and 3-methyl pyridine. 4,171,445, Cl. 546-251.000.

Bese, Andras: *See*—
Benedek, Gyorgy; Bese, Andras; Domokos, Jozsef; and Kovacs, Istvan, 4,171,100, Cl. 239-700.000.

Bethlehem Steel Corporation: *See*—
Vander Voort, George F., 4,171,233, Cl. 148-36.000.

Betz Laboratories, Inc.: *See*—
Brehm, Gary A., 4,171,276, Cl. 252-88.000.
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,171,292, Cl. 260-29.6WB.

Beyerl, Richard: *See*—
Beyerl, Robert; and Beyerl, Richard, 4,170,864, Cl. 57-3.000.

Beyerl, Robert; and Beyerl, Richard, to SHA, Torshallaverken. Apparatus for the continuous spiral winding of a tape onto an elongated body. 4,170,864, Cl. 57-3.000.

Biddlecom, William G.; Kluender, Harold C.; and Woessner, Warren D., to Miles Laboratories, Inc. 1 And 2-substituted analogues of certain prostaglandins. 4,171,331, Cl. 260-946.000.

Biermans, Paul V.: *See*—
Verhille, Karel E.; Biermans, Paul V.; and Van Keilegom, Roland, 4,171,224, Cl. 96-94.00R.

Biotronik Mess- und Therapiegerate GmbH & Co.: *See*—
Allen, Kenneth R.; Digby, Dennis; and Coombes, Alan, 4,170,999, Cl. 128-419.0PG.

Birkenfeld, Richard; Thun, Werner; and Aka, Peter, to Maschinenfabrik E. Mollers GmbH & Co. Apparatus for automatically handling stacks of bags. 4,171,178, Cl. 414-45.000.

Birkenfeld, Richard; Aka, Peter; and Lange, Hellmuth, to Maschinenfabrik E. Mollers GmbH & Co. Apparatus for loading sacks arranged in layers. 4,171,179, Cl. 414-85.000.

Bishop, Craig V.; Foley, Thomas J.; and Frank, James M., to R. O. Hull & Company, Inc. Coating solutions of trivalent chromium for coating zinc surfaces. 4,171,231, Cl. 148-6.210.

Black Clawson Company, The: *See*—
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,171,101, Cl. 241-30.000.

Black, Larry J., to Eli Lilly and Company. Novel contraceptive method. 4,171,358, Cl. 424-243.000.

Blaha, Karel: *See*—
Coupek, Jiri; Turkova, Jaroslava; Blaha, Karel; and Valentova, Olga, 4,171,412, Cl. 525-329.000.

Blakemore, Judith I.; Leute, Richard K.; and Ernst, Roberta D., to Syva Company. Enzyme-bound-polyidothyronine. 4,171,244, Cl. 435-188.000.

Blattner, Hans; and Storni, Angelo, to Ciba-Geigy Corporation. 1-Naphthothienylalkyl-1H-imidazoles. 4,171,366, Cl. 424-273.00R.

Bliss, George N. Band saw machine. 4,170,912, Cl. 83-268.000.

Bodor, Nicolae S.: *See*—
Kaminski, James J.; and Bodor, Nicolae S., 4,171,452, Cl. 560-253.000.

Boehringer Mannheim GmbH: *See*—
Wiedemann, Fritz; and Kampe, Wolfgang, 4,171,446, Cl. 548-372.000.

Boessler, Hans: *See*—
Elser, Wilhelm; Huebner, Klaus; Ottofrickenstein, Hans; and Boessler, Hans, 4,171,407, Cl. 428-500.000.

Bohm, Georg G. A.; and Anderson, John N., to Firestone Tire & Rubber Company, The. Sealant laminates. 4,171,237, Cl. 156-115.000.

Bolliger, Max; and Severus-Laubenfeld, Harald, to Swiss Aluminium Ltd. Transfer medium which is suitable for heat transfer printing on aluminum. 4,171,230, Cl. 148-6.100.

Bonczyk, Bruno C., to Alton Box Board Company. Multi-celled container carrier. 4,171,046, Cl. 206-193.000.

Booth, Anthony R., to Warner-Lambert Company. Razor cartridges. 4,170,821, Cl. 30-41.000.

Bornengo, Mario; Bacciarelli, Sergio; and Serdi, Sergio, to Montedison S.p.A. Zinc chloride adduct of benzyl-N,N-di-sec. butylthiolcarbamate and use thereof as catalyst for preparing benzyl-N,N-di-sec. butyl-thiolcarbamate from carbamoyl chloride and benzyl mercaptan. 4,171,321, Cl. 260-455.00A.

Bosch-Siemens Hausgerate GmbH: *See*—
Eck, Walter, 4,170,936, Cl. 100-39.000.

Bott, John A. License plate frame assembly. 4,170,838, Cl. 40-209.000.

Bouron, Michel: *See*—
Legrix, Georges; Junca, Gerard; Bouron, Michel; and Rustul, Pierre, 4,171,401, Cl. 428-369.000.

Bouteille, Daniel, to Societe Anonyme: La Telemecanique Electrique. Unidirectional flow limiter. 4,171,007, Cl. 137-599.000.

Bouygues: *See*—
Montacie, Marcel, 4,171,148, Cl. 299-61.000.

Boven, Jan: *See*—
Molenaar, Arian; Van Den Bogaert, Henricus M.; and Boven, Jan, 4,171,225, Cl. 106-1.230.

Boyles, Robert L., to Timex Corporation. Programmable timer. 4,171,471, Cl. 200-38.00D.

Brackenridge, David R.; and Mitchell, Lawrence C., to Ethyl Corporation. α,α'-Bis(2-hydroxyethoxy)-2,3,5,6-tetrabromo-p-xylene. 4,171,456, Cl. 568-663.000.

Braun, Ben. Embouchure pens having plural contiguous nibs. 4,171,168, Cl. 401-35.000.

Braun, David B.: *See*—
Rosen, Meyer R.; Braun, David B.; and Drap, Stephen, 4,171,337, Cl. 264-56.000.

Braun, Franz. Electrostatic coating guns. 4,171,098, Cl. 239-708.000.

Brehm, Gary A., to Betz Laboratories, Inc. Dust suppression method and composition. 4,171,276, Cl. 252-88.000.

Bremer, Edgar W. Air operated hour clock. 4,170,869, Cl. 58-42.000.

Brenner, Robert A.; and Cuthbert, Victor W., to Whirlpool Corporation. Agitator having vanes adjustable to provide different stroke lengths. 4,170,882, Cl. 68-133.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. [(Thioalkyl)thioacetyl)]cephalosporin derivatives. 4,171,435, Cl. 544-29.000.

Bridge, Ernest, Jr.: *See*—
Sullivan, Paul J.; and Bridge, Ernest, Jr., 4,170,841, Cl. 46-171.000.

Briggs, Roger L.: *See*—
Moore, Eugene R.; McDonald, David C.; Willner, Joseph; and Briggs, Roger L., 4,171,453, Cl. 562-406.000.

Brimer, Claude M.; and Von Brimer, Joe W., deceased (by Brimer, Claude M., executor), to Linear International Corporation. Integral braking system for linear induction motor. 4,171,493, Cl. 310-13.000.

Brimer, Claude M., executor: *See*—
Brimer, Claude M.; and Von Brimer, Joe W., deceased, 4,171,493, Cl. 310-13.000.

Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Partyka, Richard A., 4,171,363, Cl. 424-251.000.
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,171,438, Cl. 544-105.000.
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,171,439, Cl. 544-105.000.

British Gas Corporation: *See*—
Pallan, William, 4,170,902, Cl. 73-432.00R.

British Nuclear Fuels Ltd.: *See*—
Smith, Alfred J., 4,171,002, Cl. 134-166.00R.

British Steel Corporation: *See*—
Munro, Neil; Wellstead, Peter E.; Carter, George A.; and Cross, Mark, 4,171,336, Cl. 264-37.000.

Brooking, Hurley R.: *See*—
Beasley, Marion W.; Carroll, Harlan L.; and Brooking, Hurley R., 4,170,928, Cl. 93-37.00R.

Brooks, Burton; and Brooks, Richard J., to Chemithon Corporation, The. Spray drying method. 4,171,243, Cl. 159-48.00R.

Brooks, Fred E. Abbreviated dialing system. 4,171,469, Cl. 179-18.0BA.

Brooks, Richard J.: *See*—
Brooks, Burton; and Brooks, Richard J., 4,171,243, Cl. 159-48.00R.

Brown, Albert P.: *See—*
Hoddinott, David C.; and Brown, Albert P., 4,170,913, Cl. 83-441.000.

Brown International Corporation: *See—*
Rohm, Robert F.; and Bushman, Ronald C., 4,170,935, Cl. 100-121.000.

Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Chemical process. 4,171,325, Cl. 260-551.00C.

Brown, Timothy S., to Thermal Con-Serv Corp. Apparatus for removing condensate from steam lines, and the like. 4,171,209, Cl. 55-466.000.

Bruchmann, Winfried: *See—*
Jeschke, Henning; and Bruchmann, Winfried, 4,171,130, Cl. 271-10.000.

Bryan, Walter B.: *See—*
Trowbridge, Frank R.; Bryan, Walter B.; and Price, Charles R., 4,171,166, Cl. 366-316.000.

Bucey, Charles W.; Miller, Kenneth J.; and Robinson, Ronald R., to Caterpillar Tractor Co. Heat exchanger tube and method of making same. 4,171,015, Cl. 165-181.000.

Buck, Ronald G., to Litton Systems, Inc. Method of cooking meats in a microwave oven. 4,171,382, Cl. 426-243.000.

Buckeye Molding Company: *See—*
Allen, David O.; and Wombold, Harry A. E., 4,171,062, Cl. 220-270.000.

Bundy, Gordon L., to Upjohn Company, The. Cis-4,5-didehydro-9-deoxy-PGF compounds. 4,171,319, Cl. 260-413.000.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-alkylcarbonyl-PGF compounds. 4,171,327, Cl. 260-586.00R.

Burdet, Michel, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Control unit for electronic time-piece display. 4,170,870, Cl. 58-50.00R.

Burge, William G. Theft-prevention screw fastening. 4,170,918, Cl. 85-32.00R.

Burroughs, Harold R.; Martin, Willie E.; and Jordan, Vernon J., to Allied Chemical Corporation. Contamination-preventing closure. 4,171,061, Cl. 220-256.000.

Burth, Rolf D., to ITT Industries, Inc. Temperature compensated zener diode arrangement. 4,171,492, Cl. 307-310.000.

Burton, Parsons & Co., Inc.: *See—*
Green, Keith; and Trager, Seymour F., 4,171,377, Cl. 424-319.000.

Bushman, Ronald C.: *See—*
Rohm, Robert F.; and Bushman, Ronald C., 4,170,935, Cl. 100-121.000.

Butte, Walter A., Jr.; and Cherry, Wesley R., to Suntech, Inc. High selectivity cyanoethylation process. 4,171,322, Cl. 260-465.600.

Buxbaum, Lothar, to Ciba-Geigy Corporation. Thermoplastic copolyesters. 4,171,421, Cl. 528-194.000.

Bystrenin, Mikhail N.: *See—*
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.

C. A. Weidmuller KG: *See—*
Geiseler, Norbert, 4,171,152, Cl. 339-272.00A.

C. & J. Clark Ltd.: *See—*
Hawkins, Wallace G., 4,171,163, Cl. 366-145.000.

Cabot Corporation: *See—*
Asphahani, Aziz I.; Hodge, F. Galen; Leonard, Robert B.; and Schuur, Patrick D., 4,171,217, Cl. 75-122.000.

Calegan, Everett L., to Junkunc Bros. American Lock Company. Permutation controlled padlock. 4,170,884, Cl. 70-21.000.

Calgon Corporation: *See—*
Dixon, Kenneth W., 4,171,417, Cl. 526-245.000.

California Institute of Technology: *See—*
Anselmo, Victor J.; and Reilly, Terrence H., 4,170,987, Cl. 128-665.000.

California Processing Machinery: *See—*
Meissner, Konrad E., 4,171,042, Cl. 198-386.000.

Callahan, James L.: *See—*
Miller, Arthur F.; Callahan, James L.; and Shaw, Wilfrid G., 4,171,454, Cl. 562-546.000.

CAMECA: *See—*
Vastel, Jean, 4,171,482, Cl. 250-296.000.

Canon Kabushiki Kaisha: *See—*
Tsuda, Shin, 4,171,512, Cl. 324-133.000.

Capio, Cesar D.: *See—*
Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; Sinha, Ashok K.; and Wang, David N., 4,171,489, Cl. 250-510.000.

Carabateas, Philip M.: *See—*
Diana, Guy D.; and Carabateas, Philip M., 4,171,365, Cl. 424-273.00P.

Carbrey, Robert L., to Bell Telephone Laboratories, Incorporated. Digital wave generator for composite tone. 4,171,466, Cl. 179-15.0BY.

Card, David C., to Diamond Insulation Industries, Inc. Cellulose insulation storage bin with improved debridger. 4,171,165, Cl. 366-186.000.

Carlin, William W., to PPG Industries, Inc. Method of opening chrome ore. 4,171,248, Cl. 204-89.000.

Carmichael, Thomas F.; and Dolecek, Albert J., to Syncro Corporation. Ignition system. 4,170,977, Cl. 123-148.0CC.

Carrico, Robert J.; and Johnson, Richard D., to Miles Laboratories, Inc. Flavin adenine dinucleotide-iodothyronine conjugates. 4,171,432, Cl. 536-26.000.

Carrier, Vernon J. Chewing gum carrier and cutter. 4,170,914, Cl. 83-580.000.

Carroll, Clifford C., to Milliken Research Corporation. Polymer-modified, acid dyeable polyester and polyolefin textile materials and method for producing same. 4,171,404, Cl. 428-413.000.

Carroll, Harlan L.: *See—*
Beasley, Marion W.; Carroll, Harlan L.; and Brooking, Hurley R., 4,170,928, Cl. 93-37.00R.

Carter, Albert B., to American Air Filter Company, Inc. Air filtering unit. 4,171,211, Cl. 55-493.000.

Carter, George A.: *See—*
Munro, Neil; Wellstead, Peter E.; Carter, George A.; and Cross, Mark, 4,171,336, Cl. 264-37.000.

Carver, George E.; and Sindelar, Joseph C., to Beckley-Cardy Company. Adjustable and collapsible easel. 4,171,116, Cl. 248-464.000.

Casani, John R.: *See—*
Pounder, Edwin J.; and Casani, John R., 4,170,953, Cl. 114-144.00E.

Cassano, James R.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,171,131, Cl. 271-236.000.

Cassidy, Robert E.; and Latassa, Frank M., to GTE Sylvania Incorporated. Circuit breaker with parallel shorting element. 4,171,519, Cl. 337-25.000.

Caterpillar Tractor Co.: *See—*
Bucey, Charles W.; Miller, Kenneth J.; and Robinson, Ronald R., 4,171,015, Cl. 165-181.000.
Coulter, James A.; and Hasselbacher, Roland E., 4,171,124, Cl. 266-48.000.
Sloan, Albert E.; and Wild, Arthur, 4,171,532, Cl. 361-13.000.
Sturges, James R., 4,171,023, Cl. 172-801.000.

Cathcart, Gregory D., to Joy Manufacturing Company. Door interlock for an open-head power tong. 4,170,907, Cl. 81-57.110.

Cathcart, Gregory D.: *See—*
Peveto, John E.; and Cathcart, Gregory D., 4,170,908, Cl. 81-57.110.

Caton, Michael P. L.; Parker, Trevor; and Watkins, Gordon L., to May & Baker Limited. Cyclopentane derivatives and their pharmaceutical compositions. 4,171,375, Cl. 424-305.000.

CBS Inc.: *See—*
Rebold, Jerome I., 4,171,097, Cl. 239-341.000.

Cecce, Robert F. Antipendulation crane. 4,171,053, Cl. 212-58.00A.

Celanese Corporation: *See—*
Hannon, Martin J.; Forschirm, Alex S.; and Greene, Richard K., 4,171,056, Cl. 215-12.00R.

Cerrato, Vincent; and Hines, James, to Vending Components, Inc. Safety regulator for fluid pressure. 4,171,004, Cl. 137-116.000.

Ceskoslovenska akademie ved: *See—*
Coupek, Jiri; Turkova, Jaroslava; Blaha, Karel; and Valentova, Olga, 4,171,412, Cl. 525-329.000.

Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., to Merck & Co., Inc. 13-Halo and 13-deoxy C-076 compounds. 4,171,314, Cl. 260-343.410.

Chakravarti, Kalidas: *See—*
Lazarus, Stanley D.; Chakravarti, Kalidas; Rowan, Hugh H.; and Neal, James G., 4,171,422, Cl. 528-437.000.

Challen, Richard F.; and Garner, Terry N., to General Electric Company. Tone phase shift detector. 4,171,516, Cl. 325-466.000.

Chambley, Phillip W.; and Norris, Alan H., to WWG Industries, Inc. Yarn forming apparatus with mechanical node locking. 4,170,868, Cl. 57-293.000.

Champion International Corporation: *See—*
Fogle, Ozzie; and Cooley, James, 4,171,387, Cl. 427-54.000.

Chan, Ka-Kong; and Pawson, Beverly A., to Hoffmann-La Roche Inc. Fluorinated polyenes. 4,171,318, Cl. 260-404.000.

Chapman, Floyd A., to Hydronix, Inc. Submerged pump control. 4,171,186, Cl. 417-17.000.

Chattanooga Pharmacal Company: *See—*
Sauder, James W., 4,170,998, Cl. 128-400.000.

Checkley, David L.: *See—*
Zahn, Frederick E.; Checkley, David L.; and Titus, Wallace J., 4,171,126, Cl. 266-250.000.

Chelin, Charles R., to Towmotor Corporation. Lateral support device for outer mast upright. 4,171,181, Cl. 414-636.000.

Chem-Y, Fabriek van Chemische Produkten B.V.: *See—*
Dorrepaal, Wim; van den Haak, Gerardus M.; Weehuizen, Joseph M.; and Aalbers, Johan G., 4,171,261, Cl. 209-166.000.

Chemie-Anlagenbau Bischofsheim GmbH: *See—*
Hilterhaus, Karl; Reuter, Franz G.; and Reuter Technologie GmbH, 4,171,390, Cl. 427-244.000.

Chemische Werke Huels Aktiengesellschaft: *See—*
Frese, Albert; Roeben, Hermann; and Denzel, Horst, 4,171,295, Cl. 260-23.00H.
Muller, Dieter J.; and Knepper, Wilhelm, 4,171,324, Cl. 260-513.00B.

Chemithon Corporation, The: *See—*
Brooks, Burton; and Brooks, Richard J., 4,171,243, Cl. 159-48.00R.

Chernack, Allan D.: *See—*
Leonard, Richard L.; and Chernack, Allan D., 4,171,001, Cl. 132-53.000.

Cherry, Wesley R.: *See—*
Butte, Walter A., Jr.; and Cherry, Wesley R., 4,171,322, Cl. 260-465.600.

Chevron Research Company: *See—*
Adamson, John S., 4,171,520, Cl. 340-152.00T.
Lew, Henry Y., 4,171,425, Cl. 528-315.000.
Lew, Henry Y., 4,171,426, Cl. 528-312.000.
Mulaskey, Bernard F., 4,171,285, Cl. 252-455.00R.
O'Rear, Dennis J.; and Mayer, Jerome F., 4,171,257, Cl. 208-120.000.

Chicago Pneumatic Tool Company: *See—*
Anderson, Donald F.; and Albright, Harold J., 4,171,188, Cl. 417-282.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Huhn, Magda; Szabo, Gabor; Resofszki, Gabor; and Somfai, Eva, 4,171,303, Cl. 260-239.100.

Chiu, Herman S., to Union Carbide Corporation. Smoke colored food casing and method of producing same by use of a Maillard reaction product and an albumin. 4,171,381, Cl. 426-105.000.

Chu, Chung K.: *See—*
Watanabe, Kyoichi A.; Hirota, Kosaku; Chu, Chung K.; Reichman, Uri; and Fox, Jack J., 4,171,429, Cl. 536-1.000.

Chugairo Kogyo Kaisha Ltd.: *See—*
Tokitsu, Tetsuya, 4,170,815, Cl. 29-527.700.

Chupka, David E.: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,171,101, Cl. 241-30.000.

Chwalek, Vincent P.; and Olson, Richard M., to CPC International Inc. Wet milling process for refining whole wheat. 4,171,383, Cl. 426-623.000.

Chwalek, Vincent P.; and Olson, Richard M., to CPC International Inc. Combined dry-wet milling process for refining wheat. 4,171,384, Cl. 426-623.000.

Ciba-Geigy AG: *See—*
Donath, Peter; and Back, Gerhard, 4,171,300, Cl. 260-145.00B.

Ciba-Geigy Corporation: *See—*
Blattner, Hans; and Storni, Angelo, 4,171,366, Cl. 424-273.00R.
Buxbaum, Lothar, 4,171,421, Cl. 528-194.000.
Habermeier, Jurgen; and Berner, Godwin, 4,171,424, Cl. 528-292.000.
Kleiner, Eduard K.; and Dear, Robert E. A., 4,171,415, Cl. 526-243.000.
Mory, Rudolf, 4,171,301, Cl. 260-154.000.
Mueller, Karl F., 4,171,282, Cl. 252-356.000.
Wheeler, Ian R., 4,171,309, Cl. 260-314.500.

Cidon, Yigal: *See—*
Klein, Reuben; Klein, Imrich; and Cidon, Yigal, 4,171,195, Cl. 425-141.000.

Cincinnati Milacron Heald Corp.: *See—*
Enos, Ellsworth C., 4,170,851, Cl. 51-165.710.

Clark, Albert L., to Pac-Craft Products, Inc. Scissors lift work platform. 4,171,120, Cl. 254-1.000.

Clark, Robert C., to A & E Plastik Pak Co., Inc. Retractable awning assembly. 4,171,013, Cl. 160-22.000.

Clarke-Gravely Corporation: *See—*
Lowder, Dale E., 4,171,208, Cl. 55-216.000.

Clorox Company, The: *See—*
Maddox, Lodric L.; and Moon, Soo-Duck P., 4,171,280, Cl. 252-186.000.

Cloutier, John G. Containers for paints and other coating materials. 4,171,063, Cl. 220-307.000.

CMI Corporation: *See—*
Swisher, George W., Jr.; Smith, Donald W.; and Phillips, John F., 4,171,147, Cl. 299-39.000.

Cockram, Edwin F. Collapsible pack cart. 4,171,139, Cl. 280-652.000.

Cohen, Joseph: *See—*
Lamerant, Jean M.; Cohen, Joseph; and Maurel, Pierre, 4,171,205, Cl. 23-296.000.

Cole, Frank, to Davis-Lynch, Inc. Apparatus and method for re-entering and cementing an underwater well. 4,171,019, Cl. 166-341.000.

Colgate-Palmolive Company: *See—*
Gangwisch, William J., 4,171,075, Cl. 222-456.000.

Colgate, Samuel O.; and Ramey, Robert A., to Samuel Colgate, Robert Ramey and Associates. Apparatus for inserting an additive liquid into a flowing fluid and discharging the resultant mixture. 4,171,070, Cl. 222-133.000.

Collin Consult AB: *See—*
Collin, Lars T., 4,170,905, Cl. 74-661.000.

Collin, Lars T., to Collin Consult AB. Propulsion plant including a gas turbine and a reduction gear. 4,170,905, Cl. 74-661.000.

Collins, Albert V., to Mooney Chemicals, Inc. Lubricant compositions containing zirconyl soaps. 4,171,268, Cl. 252-32.70E.

Collins, Edward H., to Mt. Pitt Company, The. Knock-down slot-lock container. 4,171,058, Cl. 217-12.00R.

Collins, Joseph C.; and Diana, Guy D., to Sterling Drug Inc. Aryloxyalkyl keto-esters. 4,171,376, Cl. 424-308.000.

Collins, Joseph C., to Sterling Drug Inc. Aryl substituted diketones. 4,171,378, Cl. 424-331.000.

Commissariat a l'Energie Atomique: *See—*
Dumont, Maurice; and Marie, Gerard, 4,171,088, Cl. 237-2.00B.
Forrat, Francis, 4,171,003, Cl. 136-89.0PC.

Compagnie Francaise des Petroles, Societe Anonyme: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,171,175, Cl. 405-170.000.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS), Societe Anonyme: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,171,175, Cl. 405-170.000.

Compagnie Maritime d'Expertises, Societe Anonyme: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,171,175, Cl. 405-170.000.

Compair Sa (Proprietary) Limited: *See—*
Hunt, Clive W., 4,170,924, Cl. 91-232.000.

Conkle, James P.; Lackey, William W.; and Martin, Charles L., to United States of America, Air Force. Sorption tube atmospheric sampling system. 4,170,901, Cl. 73-421.50R.

Connelly, Lawrence J.; and Ballweber, Edward G., to Nalco Chemical Company. Method of hydrolyzing polyacrylamide. 4,171,296, Cl. 260-29.6WQ.

Conner, William R., Jr., to Stahl-Urban Company. Molds for manufacturing pants. 4,171,076, Cl. 223-72.000.

Connlab Holdings Limited: *See—*
Micetich, Ronald G., 4,171,304, Cl. 260-239.100.

Container Corporation of America: *See—*
Murray, Lowell C.; Weisheit, Michael L.; and Michetti, Louis C., 4,171,050, Cl. 206-463.000.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Heller, Karl H.; and Schiron, Dieter, 4,171,059, Cl. 220-4.00F.

Conway, Terry T.: *See—*
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,171,439, Cl. 544-105.000.

Cooley, James: *See—*
Fogle, Ozzie; and Cooley, James, 4,171,387, Cl. 427-54.000.

Coombes, Alan: *See—*
Allen, Kenneth R.; Digby, Dennis; and Coombes, Alan, 4,170,999, Cl. 128-419.0PG.

Cooper Tire and Rubber Company: *See—*
Klose, Karl W., 4,170,820, Cl. 29-789.000.

Cornelius, Richard T.; and Erickson, Charles G., to McQuay-Perfex Inc. Beverage dispenser. 4,171,069, Cl. 222-1.000.

Cornell, Robert W.; and Rohrbach, Carl, to United Technologies Corporation. Multi-bladed, high speed prop-fan. 4,171,183, Cl. 416-94.000.

Corning Glass Works: *See—*
Allen, Richard E.; and Segatto, Peter R., 4,171,388, Cl. 427-129.000.
Allen, Richard E.; and Segatto, Peter R., 4,171,399, Cl. 428-336.000.

Coulter, James A.; and Hasselbacher, Roland E., to Caterpillar Tractor Co. Flame cutting tip and torch holder. 4,171,124, Cl. 266-48.000.

Counihan, James. Composite structure and assembly joint for a floor system. 4,170,859, Cl. 52-763.000.

Coupek, Jiri; Turkova, Jaroslava; Blaha, Karel; and Valentova, Olga, to Ceskoslovenska akademie ved. Specific sorbent having D-aminoacid moiety covalently bonded to solid particulate hydrophilic polymeric carrier. 4,171,412, Cl. 525-329.000.

Cowen, Lloyd S. Numerical combination replacement for cylinder locks. 4,170,886, Cl. 70-302.000.

CPC International Inc.: *See—*
Chwalek, Vincent P.; and Olson, Richard M., 4,171,383, Cl. 426-623.000.
Chwalek, Vincent P.; and Olson, Richard M., 4,171,384, Cl. 426-623.000.

Craig, Jerold A.: *See—*
McAfee, Richard C.; and Craig, Jerold A., 4,171,267, Cl. 252-8.600.

Crenshaw, Ronnie R.; and Partyka, Richard A., to Bristol-Myers Company. 1,2,3-Thiadiazole process. 4,171,363, Cl. 424-251.000.

Creusot-Loire: *See—*
Leroy, Pierre J., 4,171,216, Cl. 75-76.000.

Crompton & Knowles Corporation: *See—*
Hoddinott, David C.; and Brown, Albert P., 4,170,913, Cl. 83-441.000.

Cross, Mark: *See—*
Munro, Neil; Wellstead, Peter E.; Carter, George A.; and Cross, Mark, 4,171,336, Cl. 264-37.000.

Crouse, Jere W., to Beliot Corporation. Method of continuous winding. 4,171,106, Cl. 242-66.000.

Cucuiat, Iulius M.; and Popp, Vasile V., to Institutul de Cercetari Si Proiectari Pentru Petrol Si Gaze. Desulfurization process and installation for hydrocarbon reservoir fluids produced by wells. 4,171,349, Cl. 423-574.00L.

Cumpston, Edward H. Metered feeder having a rotary groove and a cooperating scraper for difficult to meter solids. 4,171,071, Cl. 222-167.000.

Cundiff, James B.: *See—*
Sievert, William C.; Cundiff, James B.; Klobuchar, Peter A.; Lindberg, Larry H.; and Kargol, James A., 4,171,392, Cl. 427-321.000.

Curt G. Joa, Inc.: *See—*
Hirsch, John L.; and Radzins, Edmund A., 4,171,239, Cl. 156-461.000.

Cuthbert, Victor W.: *See—*
Brenner, Robert A.; and Cuthbert, Victor W., 4,170,882, Cl. 68-133.000.

D. H. Baldwin Company: *See—*
Fritz, William L.; and Munch, Walter, 4,170,916, Cl. 84-1.240.

D'Agnolo, Armando; and Favero, Giovanni, to Officine Savio S.p.A. Device for placing a cop with its yarn pulled out into a movable storage point. 4,171,105, Cl. 242-18.00R.

Daimler-Benz AG: *See—*
Hoheisel, Peter-Matthias; and Komander, Gerhard, 4,170,939, Cl. 102-28.00S.
Huber, Guntram; Hutai, Hubert; Klie, Wolfgang; Fischer, Wolfgang; Heim, Reinhold; and Labatze, Wolfgang, 4,171,143, Cl. 293-121.000.

Katz, Klaus; Pfundstein, Wolfgang; and Abt, Reinhold, 4,170,925, Cl. 91-400.000.
Schmidt, Karl-Walter, 4,170,966, Cl. 123-32.0SA.
Daley, William C.; Hall, Andrew; and Sikes, Arthur M., to Scan-Optics, Inc. Document transport. 4,171,129, Cl. 271-6.000.
Dalton, John J.: *See—*
Sadler, Thomas H.; and Dalton, John J., 4,171,238, Cl. 156-173.000.
D'Amico, John J., to Monsanto Company. N-substituted oxybenzothiazoline derivatives and their use as plant growth regulants. 4,171,213, Cl. 71-90.000.
Daniher, Francis A.; and Oswald, Alexis A., to Exxon Research & Engineering Co. Addition of N,N-dichloro-N-acyl compounds to conjugated dienes and bis-N-chlorocrotyl carbamate products therefrom. 4,171,449, Cl. 560-161.000.
Danis, Benjamin G., Jr., to Danis Industries Corporation. Articulated prefabricated modular building and method of erecting the same. 4,170,852, Cl. 52-71.000.
Danis Industries Corporation: *See—*
Danis, Benjamin G., Jr., 4,170,852, Cl. 52-71.000.
Dankworth, Juergen; Hartenstein, Helmut; and Hertling, Ludwig, to Joh. A. Benckiser GmbH. Granulated composition comprising a polymer phosphate and an alkali metal aluminum silicate, process of making and method of using same. 4,171,277, Cl. 252-99.000.
Datasaab Aktiebolag: *See—*
Rozsa, Kalman, 4,171,479, Cl. 235-449.000.
Davidson, John F.: *See—*
Newton, Alan F. R.; Haines, Kendrick P.; Harrison, David; and Davidson, John F., 4,171,249, Cl. 204-105.00R.
Davis, Geo B., Jr.: *See—*
Davis, George B., Jr., 4,171,072, Cl. 222-326.000.
Davis, George B., Jr., to Davis, Geo B., Jr. Hand held electric caulking gun. 4,171,072, Cl. 222-326.000.
Davis-Lynch, Inc.: *See—*
Cole, Frank, 4,171,019, Cl. 166-341.000.
Davis, Philip S.: *See—*
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,171,292, Cl. 260-29.6WB.
Dean, David B.: *See—*
Eddleman, William L., 4,171,250, Cl. 204-119.000.
Dear, Robert E. A.: *See—*
Kleiner, Eduard K.; and Dear, Robert E. A., 4,171,415, Cl. 526-243.000.
Deep Oil Technology, Inc.: *See—*
Walker, Raymond W., 4,171,018, Cl. 166-315.000.
Deer, Carmine, to Flagstaff Corporation. Flapper retractor. 4,171,010, Cl. 141-369.000.
de Leeuw, Franciscus H., to U.S. Philips Corporation. Device operating on the displacement of magnetic domain walls. 4,171,408, Cl. 428-539.000.
Dempsey, Russell M.: *See—*
Nolan, Mary E.; La Conti, Anthony B.; and Dempsey, Russell M., 4,171,253, Cl. 204-195.00S.
Denner, John A., Jr.; and Allen, Richard A., to Avco Corporation. Apparatus for and method of regulating the output power of gaseous lasers. 4,171,518, Cl. 331-94.50G.
Denzel, Horst: *See—*
Frese, Albert; Roeben, Hermann; and Denzel, Horst, 4,171,295, Cl. 260-23.00H.
Derfuss, Jakob: *See—*
Finkenzeller, Johann; and Derfuss, Jakob, 4,171,483, Cl. 250-321.000.
Dermy, Rene M.: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,171,175, Cl. 405-170.000.
Derolf, M. Robert; and Katsanis, Eleftherios P., to PQ Corporation. Alumina-silica binder for coating compositions. 4,171,227, Cl. 106-85.000.
Deutsche Gold- und Siber-Scheideanstalt vormals Roessler: *See—*
Beschke, Helmut; Friedrich, Heinz; and Schreyer, Gerd, 4,171,445, Cl. 546-251.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Beschke, Helmut; Friedrich, Heinz; and Kleeman, Axel, 4,171,444, Cl. 546-250.000.
deVries, Gerhard H. F.: *See—*
Lorteije, Jean H. J.; Warrink, Geert; deVries, Gerhard H. F.; and Hulshof, Jacques A. M., 4,171,524, Cl. 340-713.000.
De Vries, Robert C.: *See—*
Lee, Minyoung; Szala, Lawrence E.; and De Vries, Robert C., 4,171,339, Cl. 264-332.000.
de Vries, Tjamme: *See—*
Groothuis, Gerrit J.; and de Vries, Tjamme, 4,170,822, Cl. 30-43.920.
Dhein, Rolf; Hohlein, Peter; Kuchenmeister, Rolf; and Beer, Wolfgang, to Bayer Aktiengesellschaft. Stoving lacquers containing reactive diluents. 4,171,294, Cl. 260-22.0CQ.
Diagnostic Information: *See—*
Hunt, Robert P., 4,171,484, Cl. 250-355.000.
Diamond, George B. Pressure responsive tilt valve for pressurized container. 4,171,074, Cl. 222-402.220.
Diamond Insulation Industries, Inc.: *See—*
Card, David C., 4,171,165, Cl. 366-186.000.
Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof to treat pain, fever and inflammation. 4,171,373, Cl. 424-301.000.
Diana, Guy D.; and Carabateas, Philip M., to Sterling Drug Inc. Antiviral aryloxyalkylpyrazoles. 4,171,365, Cl. 424-273.00P.
Diana, Guy D., to Sterling Drug Inc. Diketones. 4,171,371, Cl. 424-282.000.
Diana, Guy D.: *See—*
Collins, Joseph C.; and Diana, Guy D., 4,171,376, Cl. 424-308.000.
Dickerson, Charles G.: *See—*
Schwarz, William M.; Karz, Robert S.; Erhardt, Peter F.; and Dickerson, Charles G., 4,171,274, Cl. 252-62.10P.
Dickerson, Charles W.: *See—*
Harmon, Bud G.; Skoch, Leroy V.; and Dickerson, Charles W., 4,171,379, Cl. 426-2.000.
Skoch, Leroy V.; Harmon, Bud G.; and Dickerson, Charles W., 4,171,386, Cl. 426-658.000.
DIEHL, Firma: *See—*
Arnold, Werner F., 4,171,540, Cl. 364-900.000.
Dietlein, Robert W.; and Dietlein, William R. Ski locking mechanism. 4,171,079, Cl. 224-45.00S.
Dietlein, William R.: *See—*
Dietlein, Robert W.; and Dietlein, William R., 4,171,079, Cl. 224-45.00S.
Digby, Dennis: *See—*
Allen, Kenneth R.; Digby, Dennis; and Coombes, Alan, 4,170,999, Cl. 128-419.0PG.
Dight, Lawrence B.; and Kennedy, James V., to Engelhard Minerals & Chemicals Corporation. Catalytic cracking. 4,171,286, Cl. 252-455.00Z.
Dillard, Robert D.; and Pavey, Donald E., to Eli Lilly and Company. 1-Substituted-3-amino-6,7-dialkoxy-1H-1,2,4-benzothiadiazine-1-oxides. 4,171,361, Cl. 424-246.000.
Dillman, Richard F., to Hewlett-Packard Company. Fiducial point location. 4,170,992, Cl. 128-702.000.
DiMartino, John M.: *See—*
Munsch, Charles; and DiMartino, John M., 4,171,122, Cl. 254-67.000.
Dits, Herbert R.; and Bauer, Egon A. J. Method and apparatus for controlling a press plunger system. 4,170,876, Cl. 60-547.00R.
Dixon, Kenneth W., to Calgon Corporation. Polymers with improved solvent holdout in electroconductive paper. 4,171,417, Cl. 526-245.000.
Do-All Jewelry Mfg. Co., Inc.: *See—*
Geldwerth, Simon; and Rubin, Mendek, 4,170,809, Cl. 24-230.00R.
Dobrjanskyj, Leo, to Singer Company, The. Skipped stitch detection system. 4,170,951, Cl. 112-278.000.
Dobrzanski, John, to Emhart Industries, Inc. Ionization smoke detector with controlled sensitivity. 4,171,486, Cl. 250-381.000.
Dr. Johannes Heidenhain GmbH: *See—*
Ernst, Alfons, 4,170,828, Cl. 33-125.00R.
Ernst, Alfons, 4,171,160, Cl. 356-375.000.
Holstein, Siegbert, 4,170,826, Cl. 33-125.00C.
Nelle, Gunther, 4,170,829, Cl. 33-125.00R.
Dolecek, Albert J.: *See—*
Carmichael, Thomas F.; and Dolecek, Albert J., 4,170,977, Cl. 123-148.0CC.
DoMinh, Thap, to Eastman Kodak Company. High gain Co(III)complex imaging. 4,171,221, Cl. 96-48.0HD.
Domokos, Jozsef: *See—*
Benedek, Gyorgy; Bese, Andras; Domokos, Jozsef; and Kovacs, Istvan, 4,171,100, Cl. 239-700.000.
Donath, Peter; and Back, Gerhard, to Ciba-Geigy AG. Process for the manufacture of metal complex dyes. 4,171,300, Cl. 260-145.00B.
Donley, Samuel W.; and Bacel, Peter N., to Eastman Kodak Company. Electroless plating method requiring no reducing agent in the plating bath. 4,171,393, Cl. 427-354.000.
Donovan, Andrew E.: *See—*
Groves, William H.; and Donovan, Andrew E., 4,171,164, Cl. 366-152.000.
Doorakian, George A.; and Duquette, Lawrence G., to Dow Chemical Company, The. Latent catalysts for promoting reaction of epoxides with phenols and/or carboxylic acids. 4,171,420, Cl. 528-89.000.
Dorrepaal, Wim; van den Haak, Gerardus M.; Weehuizen, Joseph M.; and Aalbers, Johan G., to Chem-Y, Fabriek van Chemische Produkten B.V. Process for the flotation of ores and collector for use in this process. 4,171,261, Cl. 209-166.000.
Doty, William T., to Maryland Cup Corporation. Tear tab disposable cup or container structure. 4,171,085, Cl. 229-1.50B.
Douglas, James L.: *See—*
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,171,438, Cl. 544-105.000.
Dow Chemical Company, The: *See—*
Doorakian, George A.; and Duquette, Lawrence G., 4,171,420, Cl. 528-89.000.
Martin, Charles W., 4,171,279, Cl. 252-148.000.
Moore, Eugene R.; McDonald, David C.; Willner, Joseph; and Briggs, Roger L., 4,171,453, Cl. 562-406.000.
Pezzoli, Paul A., 4,171,405, Cl. 428-443.000.
Dowbenko, Rostyslaw: *See—*
Hartman, Marvis E.; Dowbenko, Rostyslaw; and Hockswender, Thomas R., 4,171,413, Cl. 525-329.000.
Downing, Francis S.: *See—*
Stubbs, Vincent K.; Downing, Francis S.; and Marrs, Gordon J., 4,171,355, Cl. 424-174.000.
Doyle, Holly T.; Doyle, Robert O.; and Thomis, Wendl. Chance based submarine hunting game. 4,171,135, Cl. 273-237.000.
Doyle, John P., to Sheppee Engineering Limited. Transfer mechanism. 4,171,043, Cl. 198-430.000.

Doyle, Robert O.: *See—*
Doyle, Holly T.; Doyle, Robert O.; and Thomis, Wendl, 4,171,135, Cl. 273-237.000.
Doyle, Ross L.; and Harrison, Thomas S., to Sterling Drug Inc. Package including a container and a longitudinally folded pre-moistened web therein. 4,171,047, Cl. 206-210.000.
Drap, Stephen: *See—*
Rosen, Meyer R.; Braun, David B.; and Drap, Stephen, 4,171,337, Cl. 264-56.000.
Dremann, Charles E., to Foote Mineral Company. Alloying addition for alloying manganese to aluminum. 4,171,215, Cl. 75-0.50B.
Dresser Industries, Inc.: *See—*
Marquis, Gerald L., 4,171,031, Cl. 181-102.000.
Duke, Billy J.; and Meister, William H., to Operational Devices, Inc. Sonic pump off detector. 4,171,185, Cl. 417-12.000.
Dumenil, Claude G.; and Dumenil, Louis P. Automatic base seal. 4,170,846, Cl. 49-303.000.
Dumenil, Louis P.: *See—*
Dumenil, Claude G.; and Dumenil, Louis P., 4,170,846, Cl. 49-303.000.
Dumont, Maurice; and Marie, Gerard, to Commissariat a l'Energie Atomique. System for heating buildings. 4,171,088, Cl. 237-2.00B.
Duquette, Lawrence G.: *See—*
Doorakian, George A.; and Duquette, Lawrence G., 4,171,420, Cl. 528-89.000.
DuraCraft Boats, Inc.: *See—*
Ward, Milton K., 4,170,801, Cl. 9-1.100.
Durant, Graham J.: *See—*
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,171,325, Cl. 260-551.00C.
E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,171,435, Cl. 544-29.000.
Earth Chemical Company, Ltd.: *See—*
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,171,340, Cl. 422-36.000.
Eastman Kodak Company: *See—*
DoMinh, Thap, 4,171,221, Cl. 96-48.0HD.
Donley, Samuel W.; and Bacel, Peter N., 4,171,393, Cl. 427-354.000.
Hamblen, David P.; Glover, Clyde P.; and Kim, Sang H., 4,171,246, Cl. 204-1.00T.
Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., 4,171,275, Cl. 252-62.10L.
Eaton Corporation: *See—*
McNinch, Joseph H., Jr., 4,171,495, Cl. 310-155.000.
Eberly, Paul E., Jr., to Exxon Research & Engineering Co. Reforming with multimetallic catalysts. 4,171,259, Cl. 208-139.000.
Ebersberger, Hans: *See—*
Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenther; and Greiner, Hans-Joachim, 4,171,487, Cl. 250-408.000.
Eblen, Ewald: *See—*
Kopse, Odon; Kinzel, Richard; Eblen, Ewald; Voit, Willi; Schuster, Gregor; and Eheim, Franz, 4,171,099, Cl. 239-533.800.
Eck, Walter, to Bosch-Siemens Hausgerate GmbH. Method for removing waste. 4,170,936, Cl. 100-39.000.
Eckardt, Guenther: *See—*
Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenther; and Greiner, Hans-Joachim, 4,171,487, Cl. 250-408.000.
Eckert, Konrad; Maier, Sieghart; and Ritter, Ernst, to Robert Bosch GmbH. Control device for diesel-injection internal combustion engines. 4,170,976, Cl. 123-140.0FG.
Eddleman, William L., to Dean, David B.; and Hayden, Douglas B., Jr., part interest to each. Method for zinc ore extraction. 4,171,250, Cl. 204-119.000.
Eddy, Clifford O.; and Hoffend, Thomas R., to Xerox Corporation. Fixing device using polyarylsiloxanes as release agents. 4,170,957, Cl. 118-60.000.
Edgar Pickering (Blackburn) Limited: *See—*
Lund, Kenneth, 4,170,949, Cl. 112-79.00R.
Edwards, Lawrence J., to United States of America, Air Force. Caseless rocket design. 4,170,875, Cl. 60-253.000.
Eheim, Franz: *See—*
Kopse, Odon; Kinzel, Richard; Eblen, Ewald; Voit, Willi; Schuster, Gregor; and Eheim, Franz, 4,171,099, Cl. 239-533.800.
Ehrenfreund, Herbert A., to Tuxis Corporation. Insulative and cushioning interliner for garments and the like. 4,171,411, Cl. 521-98.000.
Eicken, Karl: *See—*
Theobald, Hans; Adolphi, Heinrich; and Eicken, Karl, 4,171,357, Cl. 424-224.000.
Eisenburg, Rolf. Trackway for a trackborne toy. 4,171,090, Cl. 238-10.00R.
Electric Power Research Institute, Inc.: *See—*
Holmes, Francis A., 4,171,474, Cl. 200-144.00B.
Eli Lilly and Company: *See—*
Black, Larry J., 4,171,358, Cl. 424-243.000.
Dillard, Robert D.; and Pavey, Donald E., 4,171,361, Cl. 424-246.000.
Paget, Charles J.; and Sands, John L., 4,171,364, Cl. 424-272.000.
Ryan, Charles W., 4,171,315, Cl. 260-345.300.
Wright, Ian G., 4,171,310, Cl. 260-326.00C.
Elliott, Lynn T. Geared limit switch. 4,171,472, Cl. 200-47.000.
Elser, Wilhelm; Huebner, Klaus; Ottofrickenstein, Hans; and Boessler, Hans, to Rohm GmbH. Method of making aqueous emulsions of acrylate copolymers in the presence of a degraded starch protective colloid. 4,171,407, Cl. 428-500.000.
Elsner, Hans J., to Westinghouse Electric Corp. Positioning calibration apparatus for transducers employed in nuclear reactor vessel inspection apparatus. 4,170,891, Cl. 73-1.00R.
Emerson Electric Co.: *See—*
Kunz, Bernard L., 4,171,087, Cl. 236-68.00R.
Emhart Industries, Inc.: *See—*
Dobrzanski, John, 4,171,486, Cl. 250-381.000.
EMI Limited: *See—*
Waltham, Richard M., 4,171,476, Cl. 250-445.00T.
Emmert Mfg. Co., Inc.: *See—*
Johnston, Larry C., 4,171,172, Cl. 403-71.000.
Emmett, John C.: *See—*
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,171,325, Cl. 260-551.00C.
Emmett, John E., to Hooker Chemicals & Plastics Corp. Fluted core disc brake piston. 4,170,926, Cl. 92-212.000.
Enenkel, Hans-Joachim: *See—*
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,171,370, Cl. 424-282.000.
Engelhard Minerals & Chemicals Corporation: *See—*
Dight, Lawrence B.; and Kennedy, James V., 4,171,286, Cl. 252-455.00Z.
Keith, Carl D., 4,171,287, Cl. 252-462.000.
Keith, Carl D.; Larsen, William R.; and Shimrock, Thomas, 4,171,288, Cl. 252-462.000.
Enos, Ellsworth C., to Cincinnati Milacron Heald Corp. Grinding machine. 4,170,851, Cl. 51-165.710.
Erenyi, Bruno: *See—*
Horvath, Kalman; and Erenyi, Bruno, 4,170,850, Cl. 51-165.00R.
Erhardt, Peter F.: *See—*
Schwarz, William M.; Karz, Robert S.; Erhardt, Peter F.; and Dickerson, Charles G., 4,171,274, Cl. 252-62.10P.
Erickson, Charles G.: *See—*
Cornelius, Richard T.; and Erickson, Charles G., 4,171,069, Cl. 222-1.000.
Erickson, Norman B., to Norlin Industries, Inc. Flexible switch contact having a precious metal contact surface. 4,171,475, Cl. 200-241.000.
Eriksson, Jarl-Thure. Apparatus for transferring electrical current between two electrical conductors which can be brought into a movement of rotation in relation to each other around a common axis. 4,171,496, Cl. 310-219.000.
Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Error correction apparatus for longitudinal measuring instrument. 4,170,828, Cl. 33-125.00R.
Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Distance measuring instrument. 4,171,160, Cl. 356-375.000.
Ernst, Edwin F. Plastic bag construction in serial roll form. 4,171,048, Cl. 206-390.000.
Ernst, Roberta D.: *See—*
Blakemore, Judith I.; Leute, Richard K.; and Ernst, Roberta D., 4,171,244, Cl. 435-188.000.
Ershov, Oleg L.: *See—*
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.
Eschwey, Helmut; Willmund, Wolf-Dieter; and Gress, Wolfgang, to Henkel Kommanditgsellschaft auf Aktien. Aqueous dispersions of alkyd and/or amino resins containing amine oxides. 4,171,293, Cl. 260-22.00A.
Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., to Akzona, Inc. Textured yarn product. 4,171,402, Cl. 428-369.000.
Eslami, Ali. Rotary engine. 4,170,978, Cl. 123-239.000.
Estes, John H.: *See—*
Koniz, Leon F.; and Estes, John H., 4,171,329, Cl. 585-487.000.
Etablissements Martel, Catala & Cie S.A.: *See—*
Karm, Robert, 4,171,009, Cl. 139-425.00A.
Ethyl Corporation: *See—*
Brackenridge, David R.; and Mitchell, Lawrence C., 4,171,456, Cl. 568-663.000.
Etudes Petrolieres Marines, Societe a Responsabilite Limitee: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,171,175, Cl. 405-170.000.
Evenchik, Leonard N., to Bell Telephone Laboratories, Incorporated. Signal multiplexing circuit. 4,171,467, Cl. 179-15.0BM.
Expert N.V.: *See—*
Oosterling, Pieter A.; and Van Zweeden, Adriaan, 4,170,934, Cl. 100-100.000.
Exxon Research & Engineering Co.: *See—*
Daniher, Francis A.; and Oswald, Alexis A., 4,171,449, Cl. 560-161.000.
Eberly, Paul E., Jr., 4,171,259, Cl. 208-139.000.
Gaspar, Noel J., 4,171,258, Cl. 208-144.000.
Koenecke, Donald F., 4,171,254, Cl. 204-197.000.
Marin, Pierre D.; Prillieux, Marcel; and Tirtiaux, Robert, 4,171,323, Cl. 260-501.190.
Vannice, M. Albert; and Tauster, Samuel J., 4,171,320, Cl. 260-449.00R.
Wagensommer, Joseph; and Manalastas, Pacifico V., 4,171,414, Cl. 526-185.000.
Wheelock, Kenneth S., 4,171,289, Cl. 252-466.0PT.
Fajans, Jack. Heating device for a percolator and method of using the same. 4,170,931, Cl. 99-312.000.

Fantazier, Richard M., to Armstrong Cork Company. Peroxy photoinitiator system for photopolymerizable compositions. 4,171,252, Cl. 204-159.230.

Farber, Jurgen: *See*—
Friess, Hans; Kettenbach, Fritz; Farber, Jurgen; Witter, Karl T.; and Strole, Ulrich, 4,171,064, Cl. 220-418.000.

Farcasiu, Malvina; and Scott, Eric J. Y., to Mobil Oil Corporation. Process for reducing thiophenic sulfur in heavy oil. 4,171,260, Cl. 208-240.000.

Fast Food Fabricators, Inc.: *See*—
Meamber, Jon F., 4,170,933, Cl. 99-349.000.

Faulkner, Keith; and Appleford, David E., to Portionmat (Engineering) Limited. Weighing and dispensing device. 4,171,067, Cl. 222-1.000.

Faust, Paul J.; and Pless, Otto C., Jr., to Standard Oil Company (Indiana). Startup procedure for the synthesis of ammonia. 4,171,343, Cl. 423-359.000.

Favero, Giovanni: *See*—
D'Agnolo, Armando; and Favero, Giovanni, 4,171,105, Cl. 242-18.00R.

Faxon, Merle W., to Raytheon Company. Radar system with stable power output. 4,171,514, Cl. 325-121.000.

Federal Products Corporation: *See*—
Olasz, Joseph S., 4,170,831, Cl. 33-178.00R.

Fedotov, Evgeny V.: *See*—
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.

Feintuch, Martin W.: *See*—
Tawfik, David A.; and Feintuch, Martin W., 4,171,539, Cl. 364-900.000.

Feres, Vaclav. Extractor pump for fluids under vacuum. 4,171,182, Cl. 415-90.000.

Ferro Manufacturing Corporation: *See*—
Pickles, Joseph, 4,170,847, Cl. 49-349.000.

Filan, A. LaVerne: *See*—
Filan, Alton N.; and Filan, A. LaVerne, 4,171,095, Cl. 239-200.000.

Filan, Alton N.; and Filan, A. LaVerne. Sprinkler and valve operator. 4,171,095, Cl. 239-200.000.

Fink, Roger H.: *See*—
Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., 4,171,402, Cl. 428-369.000.

Finkenzeller, Johann; and Derfuss, Jakob, to Siemens AG. Device for X-ray diagnosis, including edge shadow-free compression device. 4,171,483, Cl. 250-321.000.

Finster, Theodor; Fricke, Hans-Dieter; and Schumann, Horst, to Th. Goldschmidt AG. Aluminothermic reaction mixture based on cupric oxide. 4,171,232, Cl. 148-24.000.

Firestone Tire & Rubber Company, The: *See*—
Bohm, Georg G. A.; and Anderson, John N., 4,171,237, Cl. 156-115.000.

Fischell, Robert E.; Fountain, Glen H.; Mobley, Frederick F.; and Sadilek, Albert C., to United States of America, Navy. Single-axis disturbance compensation system. 4,170,904, Cl. 74-5.60E.

Fischer, Wolfgang: *See*—
Huber, Guntram; Hutai, Hubert; Klie, Wolfgang; Fischer, Wolfgang; Heim, Reinhold; and Labatze, Wolfgang, 4,171,143, Cl. 293-121.000.

Fisher, Michael H.: *See*—
Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., 4,171,314, Cl. 260-343.410.

Fisons Limited: *See*—
Haynes, Harold G.; and Taylor, Robert W., 4,171,372, Cl. 424-282.000.

Flagstaff Corporation: *See*—
Deer, Carmine, 4,171,010, Cl. 141-369.000.

Fleury, Guy J.: *See*—
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,171,175, Cl. 405-170.000.

Flinn, Robert W.; and Robinson, Roy D., to American Greetings Corporation. Candle manufacturing system and method. 4,170,860, Cl. 53-170.000.

Fluck, Jakob; and Schenkel, Eduard, to Rieter Machine Works, Ltd. Apparatus for threading up and placing a thermoplastic thread on a heating device of a textile machine. 4,171,201, Cl. 432-59.000.

Flygstad, Dean W.; and Aronoff, Michael I., to Telex Communications, Inc. Tape guide. 4,171,082, Cl. 226-196.000.

FMC Corporation: *See*—
Roberts, Thomas E., Jr.; Wright, Bruce M.; Watson, Clyde D.; and Abbott, John A., 4,171,263, Cl. 210-8.000.
Wright, R. Martin, 4,171,272, Cl. 252-46.700.

Fogle, Ozzie; and Cooley, James, to Champion International Corporation. Coating wood substrates. 4,171,387, Cl. 427-54.000.

Foley, Thomas J.: *See*—
Bishop, Craig V.; Foley, Thomas J.; and Frank, James M., 4,171,231, Cl. 148-6.210.

Foote Mineral Company: *See*—
Dremann, Charles E., 4,171,215, Cl. 75-0.50B.

Forest Products Industrial Designs, Inc.: *See*—
Ayers, Thomas A.; and Ayers, Peter T., 4,170,911, Cl. 83-104.000.

Forkner, John H. Cooked dough envelope having frozen filling and method therefor. 4,171,380, Cl. 426-95.000.

Forrat, Francis, to Commissariat a l'Energie Atomique. Solar energy to electrical energy converter. 4,171,003, Cl. 136-89.0PC.

Forschirm, Alex S.: *See*—
Hannon, Martin J.; Forschirm, Alex S.; and Greene, Richard K., 4,171,056, Cl. 215-12.00R.

Fountain, Glen H.: *See*—
Fischell, Robert E.; Fountain, Glen H.; Mobley, Frederick F.; and Sadilek, Albert C., 4,170,904, Cl. 74-5.60E.

Fowler, Michael C., to United Technologies Corporation. Laser photochemical separation of hydrogen isotopes. 4,171,251, Cl. 204-158.00R.

Fowles, Thomas A.: *See*—
Winchell, David A.; and Fowles, Thomas A., 4,171,236, Cl. 156-69.000.

Fox, Jack J.: *See*—
Watanabe, Kyoichi A.; Hirota, Kosaku; Chu, Chung K.; Reichman, Uri; and Fox, Jack J., 4,171,429, Cl. 536-1.000.

Fraas, Lewis M.; Zanio, Kenneth R.; and Knechtli, Ronald C., to Hughes Aircraft Company. Process for fabricating heterojunction structures utilizing a double chamber vacuum deposition system. 4,171,235, Cl. 148-175.000.

Frank, Arlen W., to United States of America, Agriculture. Quaternary phosphonium salts bearing carbamate groups. 4,171,448, Cl. 560-158.000.

Frank, James M.: *See*—
Bishop, Craig V.; Foley, Thomas J.; and Frank, James M., 4,171,231, Cl. 148-6.210.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,170,942, Cl. 104-7.00B.

Freedman, David: *See*—
Snyder, Philip; and Freedman, David, 4,170,861, Cl. 53-468.000.

Frese, Albert; Roeben, Hermann; and Denzel, Horst, to Chemische Werke Huels Aktiengesellschaft. Aqueous emulsions of polyolefins/-bitumen plastic or plastic-elastic materials and process for the production thereof. 4,171,295, Cl. 260-23.00H.

Fricke, Hans-Dieter: *See*—
Finster, Theodor; Fricke, Hans-Dieter; and Schumann, Horst, 4,171,232, Cl. 148-24.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Baumgart, Frank; Bensmann, Gunter; Haasters, Jorg; Hartwig, Jurgen; Jorde, Joachim; Muller, Manfred; and Schlegel, Karl F., 4,170,990, Cl. 128-92.00B.

Friedrich, Heinz: *See*—
Beschke, Helmut; Friedrich, Heinz; and Kleeman, Axel, 4,171,444, Cl. 546-250.000.
Beschke, Helmut; Friedrich, Heinz; and Schreyer, Gerd, 4,171,445, Cl. 546-251.000.

Friess, Hans; Kettenbach, Fritz; Farber, Jurgen; Witter, Karl T.; and Strole, Ulrich, to Papier- und Kunststoff-Werke Linnich G.m.b.H. Cardboard blank for gas-tight and liquid-tight folding boxes. 4,171,064, Cl. 220-418.000.

Fritz, William L.; and Munch, Walter, to D. H. Baldwin Company. Touch operated capacitive switch for electronic musical instruments. 4,170,916, Cl. 84-1.240.

Frob, Gerd, to Mayser-GmbH & Co. Elastic body and method of making same. 4,171,410, Cl. 521-52.000.

Fromm, Dietrich; Seehawer, Jurgen; Wagner, Wolf-Jurgen; and Winzerling, Erich, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. High pressure electric discharge lamp containing metal halides. 4,171,498, Cl. 313-229.000.

Frommeld, Hans-Dieter, to Hoechst Aktiengesellschaft. Two-component diazotype material. 4,171,222, Cl. 96-75.000.

Fuji Photo Film Co., Ltd.: *See*—
Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Yoneyama, Masakazu, 4,171,406, Cl. 428-447.000.

Fujita, Tetsuya T.; and Bedard, Alfred J., Jr., to United States of America, Commerce. Method and apparatus for measuring gas flow speed. 4,170,899, Cl. 73-189.000.

Fujiyama, Masaaki: *See*—
Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Yoneyama, Masakazu, 4,171,406, Cl. 428-447.000.

Fukai, Masakazu: *See*—
Nagata, Seiichi; Tanaka, Tsuneo; and Fukai, Masakazu, 4,171,234, Cl. 148-175.000.

Fukuhara, Toru, to Nippon Kogaku K.K. TTL Metering device in a single lens reflex camera. 4,171,154, Cl. 354-23.00R.

Fukuzawa, Tadashi: *See*—
Tashimizu, Shinkichi; Suzuki, Teruki; and Fukuzawa, Tadashi, 4,171,501, Cl. 313-486.000.

Funari, Joseph, to International Business Machines Corporation. Microsurface welding. 4,171,477, Cl. 219-56.210.

G. D. Searle & Co.: *See*—
Salamon, Karlene W., 4,171,312, Cl. 260-340.200.

G. M. Sommer Company, Inc.: *See*—
Sommer, Gordon M., 4,171,038, Cl. 192-70.130.

Gach, Peter P., to Sunbeam Plastics Corporation. Child-resistant medicine vial. 4,171,057, Cl. 215-211.000.

Gale, Anthony G.: *See*—
Lings, Barry W.; and Gale, Anthony G., 4,171,184, Cl. 416-97.00R.

Galitsky, Nikolai V.: *See*—
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.

Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.;

Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N. Graphitization and reducing charge. 4,171,281, Cl. 252-188.000.

Gallant, James O., to SW (Delaware), Inc. Liquid lubricated roll with recirculation system. 4,171,034, Cl. 184-6.240.

Gallo, Mario; and Wirth, Johannes, to Wirth, Gallo & Co. Scale with a computing device and a digital display, in particular for commercial applications. 4,171,026, Cl. 177-25.000.

Ganellin, Charon R.: *See—*
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,171,325, Cl. 260-551.00C.

Gangwisch, William J., to Colgate-Palmolive Company. Dispensing and metering container. 4,171,075, Cl. 222-456.000.

Garlick, Thomas W. Cathode starting sheet assembly machines. 4,170,816, Cl. 29-432.100.

Garner, Terry N.: *See—*
Challen, Richard F.; and Garner, Terry N., 4,171,516, Cl. 325-466.000.

Gashenko, Stanislav I.: *See—*
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.

Gaspar, Noel J., to Exxon Research & Engineering Co. Catalyst and process for hydroconversion of hydrocarbons using steam. 4,171,258, Cl. 208-144.000.

Geartner, Herbert: *See—*
Miniere, Jack K., 4,170,989, Cl. 128-52.000.

Geiseler, Norbert, to C. A. Weidmuller KG. Terminal for printed circuits. 4,171,152, Cl. 339-272.00A.

Geldwerth, Simon; and Rubin, Mendek, to Do-All Jewelry Mfg. Co., Inc. Axial jewelry clasp. 4,170,809, Cl. 24-230.00R.

General Electric Company: *See—*
Bain, Benjamin H., Jr., 4,170,835, Cl. 38-77.500.
Challen, Richard F.; and Garner, Terry N., 4,171,516, Cl. 325-466.000.
Lee, Minyoung; Szala, Lawrence E.; and De Vries, Robert C., 4,171,339, Cl. 264-332.000.
Nolan, Mary E.; La Conti, Anthony B.; and Dempsey, Russell M., 4,171,253, Cl. 204-195.00S.
Schrader, Paul D., 4,171,533, Cl. 361-22.000.

Gentile, Anthony L.: *See—*
Pinnow, Douglas A.; and Gentile, Anthony L., 4,170,997, Cl. 128-395.000.

Geo. P. Reintjes Co., Inc.: *See—*
Musser, John J., 4,170,856, Cl. 52-598.000.

Gerard, Rene; and Lacombat, Michel, to Thomson-CSF. System for positioning an object in an optical projection system. 4,171,162, Cl. 356-401.000.

Germack, Walter F.; and Smith, William L. Additive supply and control device. 4,170,960, Cl. 123-198.00A.

Gettig, William A. Multi-pole switch. 4,171,470, Cl. 200-6.00A.

Getz, Lynn L.: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,171,101, Cl. 241-30.000.

Gillespie, James E.: *See—*
Marks, Harold C.; and Gillespie, James E., 4,171,149, Cl. 301-37.00P.

Girling Limited: *See—*
Pickering, John F., 4,170,877, Cl. 60-592.000.

Giuliani, David J.: *See—*
Tobey, Morley C., Jr.; Giuliani, David J.; and Ashkin, Peter B., 4,170,818, Cl. 29-571.000.

Glover, Clyde P.: *See—*
Hamblen, David P.; Glover, Clyde P.; and Kim, Sang H., 4,171,246, Cl. 204-1.00T.

Gohnert, Walther. Fuel-air mixer for carburetors. 4,171,332, Cl. 261-78.00R.

Golata, John H., to Motor Wheel Corporation. Apparatus for spin-forming wheel rims. 4,170,888, Cl. 72-82.000.

Goodyear Tire & Rubber Company, The: *See—*
Badberg, Melvin C.; and Olsen, Roy W., 4,171,118, Cl. 249-183.000.

Gorbatenko, Eduard V.: *See—*
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.

Gordon, Alan J.: *See—*
Henderson, Kenneth J.; and Gordon, Alan J., 4,171,241, Cl. 156-556.000.

Goretti, Cesare, to Italiana Prefabbricazione Edile S.p.A. Plant for the production of concrete elements. 4,171,194, Cl. 425-88.000.

Gottier, Paul, to Soncarato, Joseph C., a part interest. Solar energy storage and distributing device. 4,170,982, Cl. 126-99.00A.

Grant, Hendrie J.: *See—*
Taylor, David H.; Grant, Hendrie J.; and Shirek, Lawrence J., 4,171,192, Cl. 418-32.000.

Grapes, Robert D.; and Watson, Donald J., to Magnetic Peripherals Inc. Device for centering and driving flexible discs. 4,171,531, Cl. 360-99.000.

Gray, Paul R.: *See—*
Stephens, Mark L.; and Gray, Paul R., 4,171,509, Cl. 323-75.00C.

Great Plains Manufacturing Incorporated: *See—*
Applequist, Roy E., 4,171,022, Cl. 172-311.000.

Green, Keith; and Trager, Seymour F., to Burton, Parsons & Co., Inc. Ophthalmic solution of tranexamic acid. 4,171,377, Cl. 424-319.000.

Greene, Richard K.: *See—*
Hannon, Martin J.; Forschirm, Alex S.; and Greene, Richard K., 4,171,056, Cl. 215-12.00R.

Greiner, Hans-Joachim: *See—*
Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenther; and Greiner, Hans-Joachim, 4,171,487, Cl. 250-408.000.

Gress, Wolfgang: *See—*
Eschwey, Helmut; Willmund, Wolf-Dieter; and Gress, Wolfgang, 4,171,293, Cl. 260-22.00A.

Grieshaber, Hermann: *See—*
Wessel, Wolf; Grieshaber, Hermann; and Holzbaur, Siegfried, 4,170,975, Cl. 123-139.0AW.

Griffiths, David T., to Youngflex S.A. Spring panel for seat cushion support structure. 4,171,125, Cl. 267-102.000.

Groothuis, Gerrit J.; and de Vries, Tjamme, to U.S. Philips Corporation. Dry shaving apparatus. 4,170,822, Cl. 30-43.920.

Groves, William H.; and Donovan, Andrew E., to Kartridg Pak Co., The. Continuous X-ray analysis for meat blending system. 4,171,164, Cl. 366-152.000.

Gruber, Franz: *See—*
Lang, Udo; Gruber, Franz; Anand, Satish; and Lehmer, Wilhelm, 4,170,881, Cl. 62-538.000.

GTE Sylvania Incorporated: *See—*
Cassidy, Robert E.; and Latassa, Frank M., 4,171,519, Cl. 337-25.000.

Guggenheim, Howard J., to Bell Telephone Laboratories, Incorporated. Crystal growth from solution. 4,171,344, Cl. 423-364.000.

Gustafsson, Lars; and Kallqvist, Ulf G. Fastener means. 4,170,807, Cl. 24-137.00R.

Gyorgy, Ernst M.; LeCraw, Roy C.; and Wolfe, Raymond, to Bell Telephone Laboratories, Incorporated. Process for suppressing hard bubbles in magnetic bubble devices. 4,171,389, Cl. 427-130.000.

Haas, Herbert G.: *See—*
Munk, Edmund E.; and Haas, Herbert G., 4,171,396, Cl. 428-171.000.

Haasters, Jorg: *See—*
Baumgart, Frank; Bensmann, Gunter; Haasters, Jorg; Hartwig, Jurgen; Jorde, Joachim; Muller, Manfred; and Schlegel, Karl F., 4,170,990, Cl. 128-92.00B.

Habermeier, Jurgen; and Berner, Godwin, to Ciba-Geigy Corporation. Polyesters containing units derived from metal salts of N-hydroxyalkylated branched α-aminoacids. 4,171,424, Cl. 528-292.000.

Hahn, Shelton T. Portable shower. 4,170,795, Cl. 4-145.000.

Haines, Kendrick P.: *See—*
Newton, Alan F. R.; Haines, Kendrick P.; Harrison, David; and Davidson, John F., 4,171,249, Cl. 204-105.00R.

Hajtomuvek es Festoberendezesek Gyara: *See—*
Benedek, Gyorgy; Bese, Andras; Domokos, Jozsef; and Kovacs, Istvan, 4,171,100, Cl. 239-700.000.

Hakata, Yoshihisa; and Nakazawa, Masahiro, to Sky Bussan Kabushiki Kaisha. Burner of air adjustment type provided with annular air passage. 4,170,981, Cl. 126-43.000.

Halbritter, Klaus: *See—*
Schuster, Ludwig; Hickmann, Eckhard; and Halbritter, Klaus, 4,171,458, Cl. 568-735.000.

Halfen, Norbert. Apparatus for making use of water for health care. 4,171,094, Cl. 239-186.000.

Hall, Andrew: *See—*
Daley, William C.; Hall, Andrew; and Sikes, Arthur M., 4,171,129, Cl. 271-6.000.

Hamblen, David P.; Glover, Clyde P.; and Kim, Sang H., to Eastman Kodak Company. Method for determining ionic activity of components of liquid drops. 4,171,246, Cl. 204-1.00T.

Hamburger, Robert N., to University of California, The Regents of the. Polypeptide agents for blocking the human allergic response. 4,171,299, Cl. 260-112.50R.

Hamlin, Thomas J.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,171,131, Cl. 271-236.000.

Hanahara, Tohru: *See—*
Tatetsuki, Kuniharu; Hanahara, Tohru; Nakano, Takeshi; and Morisue, Kazushige, 4,171,490, Cl. 250-564.000.

Hannon, Martin J.; Forschirm, Alex S.; and Greene, Richard K., to Celanese Corporation. Coated bottle and method of coating. 4,171,056, Cl. 215-12.00R.

Hanson, Kenneth M.: *See—*
Wolgemuth, Richard L.; Hanson, Kenneth M.; and Zassenhaus, Peter H., 4,171,352, Cl. 424-9.000.

Hara, Yasuhiko: *See—*
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.

Harada, Takashi: *See—*
Nohara, Yasumoto; Harada, Yukio; Toyooka, Morio; and Harada, Takashi, 4,171,049, Cl. 206-328.000.

Harada, Yukio: *See—*
Nohara, Yasumoto; Harada, Yukio; Toyooka, Morio; and Harada, Takashi, 4,171,049, Cl. 206-328.000.

Harang, Hakon; Widding, Karl; Andreassen, Knut A.; and Holte, Johan B., to Norsk Hydro a.s. Method for preparing active cathodes for electrochemical processes. 4,171,247, Cl. 204-34.000.

Hard, Robert A., to Occidental Research Corporation. Recovery of shale oil and magnesia from oil shale. 4,171,146, Cl. 299-2.000.

Hardwick, Roy E.: *See*—
King, Larry K.; and Hardwick, Roy E., 4,171,346, Cl. 423-496.000.

Harmon, Bud G.; Skoch, Leroy V.; and Dickerson, Charles W., to Ralston Purina Company. Feed supplement for baby pigs. 4,171,379, Cl. 426-2.000.

Harmon, Bud G.: *See*—
Skoch, Leroy V.; Harmon, Bud G.; and Dickerson, Charles W., 4,171,386, Cl. 426-658.000.

Harrison, David: *See*—
Newton, Alan F. R.; Haines, Kendrick P.; Harrison, David; and Davidson, John F., 4,171,249, Cl. 204-105.00R.

Harrison, George W., to Team, Inc. Leak repair clamp. 4,171,142, Cl. 285-10.000.

Harrison, Thomas S.: *See*—
Doyle, Ross L.; and Harrison, Thomas S., 4,171,047, Cl. 206-210.000.

Harshaw Chemical Company, The: *See*—
Rosette, King H.; and Packer, Herbert, 4,171,400, Cl. 428-357.000.

Hartenstein, Helmut: *See*—
Dankworth, Juergen; Hartenstein, Helmut; and Hertling, Ludwig, 4,171,277, Cl. 252-99.000.

Hartman, Marvis E.; Dowbenko, Rostyslaw; and Hockswender, Thomas R., to PPG Industries, Inc. Acrylic hydrazides. 4,171,413, Cl. 525-329.000.

Hartwig, Jurgen: *See*—
Baumgart, Frank; Bensmann, Gunter; Haasters, Jorg; Hartwig, Jurgen; Jorde, Joachim; Muller, Manfred; and Schlegel, Karl F., 4,170,990, Cl. 128-92.00B.

Harvey, Harry M., to Rolls-Royce Limited. V.S.T.O.L. aircraft with control means for maintaining substantially equal thrust on both sides of the aircraft. 4,171,112, Cl. 244-12.500.

Hass, Robert H., to Union Oil Company of California. Catalytic incineration of hydrogen sulfide from gas streams. 4,171,347, Cl. 423-539.000.

Hasselbacher, Roland E.: *See*—
Coulter, James A.; and Hasselbacher, Roland E., 4,171,124, Cl. 266-48.000.

Hatton, Derald R.: *See*—
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,171,101, Cl. 241-30.000.

Haviv, Fortuna; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. 7-[(Pyridylthiomethyl)phenyl-]acetamidocephalosporin derivatives. 4,171,434, Cl. 544-27.000.

Havrilla, John V.: *See*—
Welsh, John; Havrilla, John V.; and Havrilla, John W., 4,171,096, Cl. 239-291.000.

Havrilla, John W.: *See*—
Welsh, John; Havrilla, John V.; and Havrilla, John W., 4,171,096, Cl. 239-291.000.

Hawkins, Wallace G., to C. & J. Clark Ltd. Moulding of plastics. 4,171,163, Cl. 366-145.000.

Hawn, Robert D., to Bell & Howell Company. Peripheral drive tape winding methods and apparatus. 4,171,110, Cl. 242-192.000.

Hayden, Douglas B., Jr.: *See*—
Eddleman, William L., 4,171,250, Cl. 204-119.000.

Haynes, Harold G.; and Taylor, Robert W., to Fisons Limited. 2,2-Dimethyl-1,3-benzodioxol-4-yl N-methylcarbamate of crystalline form A. 4,171,372, Cl. 424-282.000.

Haynes, Harold L.; and Morrison, Albert R., to Owens-Corning Fiberglas Corporation. Glass fiber coated with a hydroxy-ethylated starch, a tertiary amine etherified starch, and a methyl methacrylate latex polymer or co-polymer. 4,171,403, Cl. 428-392.000.

Heath, James E.: *See*—
Benson, Arnold M.; Heath, James E.; and Matovich, Mark A., 4,171,264, Cl. 210-40.000.

Heim, Reinhold: *See*—
Huber, Guntram; Hutai, Hubert; Klie, Wolfgang; Fischer, Wolfgang; Heim, Reinhold; and Labatze, Wolfgang, 4,171,143, Cl. 293-121.000.

Heitzer, Helmut: *See*—
Beck, Gunther; and Heitzer, Helmut, 4,171,442, Cl. 544-334.000.

Heller, Karl H.; and Schiron, Dieter, to Continental Gummi-Werke Aktiengesellschaft. Stackable loading platform. 4,171,059, Cl. 220-4.00F.

Henderson, Kenneth J.; and Gordon, Alan J., to Shandon Southern Products Limited. Dispensers for thin flat rigid articles. 4,171,241, Cl. 156-556.000.

Hendriks, Petrus F. A. M.: *See*—
van Hardeveld, Rudolf; and Hendriks, Petrus F. A. M., 4,171,091, Cl. 239-8.000.

Henkel Corporation: *See*—
Krbechek, LeRoy O., 4,171,317, Cl. 260-397.470.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, 4,171,278, Cl. 252-102.000.
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,171,203, Cl. 8-10.200.

Henkel Kommanditgsellschaft auf Aktien: *See*—
Eschwey, Helmut; Willmund, Wolf-Dieter; and Gress, Wolfgang, 4,171,293, Cl. 260-22.00A.

Henriques, Joseph. Frustoconical burner can assembly. 4,171,199, Cl. 431-351.000.

Herleth, Karl, to Magnetronic Gesellschaft fur Elektronisch-Mechanisch Gerate mbH & Co. Entwicklungs KG, Firma. Drive mechanism for a tape recorder. 4,171,111, Cl. 242-201.000.

Hertling, Ludwig: *See*—
Dankworth, Juergen; Hartenstein, Helmut; and Hertling, Ludwig, 4,171,277, Cl. 252-99.000.

Hesselgren, Sven-Gunnar. Method of destroying infectious material of disposable type. 4,171,226, Cl. 106-15.050.

Heuer, Dale A.; Schloss, Phillip C.; and Schroeder, Larry L., to International Business Machines Corporation. Microprocessor system. 4,171,536, Cl. 364-200.000.

Hewlett-Packard Company: *See*—
Dillman, Richard F., 4,170,992, Cl. 128-702.000.
Tobey, Morley C., Jr.; Giuliani, David J.; and Ashkin, Peter B., 4,170,818, Cl. 29-571.000.

HIAB-FOCO Aktiebolag: *See*—
Palmcrantz, Jan B.; and Rilbe, Ulf C., 4,170,854, Cl. 52-115.000.

Hiasa, Yukio: *See*—
Tanimoto, Tateo; Hiasa, Yukio; Tsukamoto, Hidehiko; Ichikizaki, Tetsuo; Shindo, Akihiro; and Wakayama, Akira, 4,170,889, Cl. 72-85.000.

Hickmann, Eckhard: *See*—
Schuster, Ludwig; Hickmann, Eckhard; and Halbritter, Klaus, 4,171,458, Cl. 568-735.000.

Hidaka Engineering Company, Limited: *See*—
Kojima, Toyoo, 4,170,890, Cl. 72-359.000.

Higa, Osamu; and Seki, Nagataka, to Tokyo Shibaura Electric Company, Limited. Apparatus for synchronization control of a plurality of inverters. 4,171,517, Cl. 328-72.000.

Higgs, Victor W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Position locking device for visor on a helmet. 4,170,792, Cl. 2-10.000.

Hill, David T., to SmithKline Corporation. Phosphinegold (I) salts having antiarthritic activity. 4,171,360, Cl. 424-245.000.

Hill, Howard D. W., to Varian Associates, Inc. Automatic field-frequency lock in an NMR spectrometer. 4,171,511, Cl. 324-313.000.

Hilterhaus, Karl; Reuter, Franz G.; and Reuter Technologie GmbH, to Chemie-Anlagenbau Bischofsheim GmbH. Process for preparing filter material. 4,171,390, Cl. 427-244.000.

Hilti Aktiengesellschaft: *See*—
Lippacher, Wolfgang; Teger, Gerhard; and Reitberger, Rudolf, 4,171,083, Cl. 227-69.000.

Hines, James: *See*—
Cerrato, Vincent; and Hines, James, 4,171,004, Cl. 137-116.000.

Hino, Izumi: *See*—
Nagaoka, Tadashi; and Hino, Izumi, 4,171,136, Cl. 274-23.00A.

Hinshaw, Cecil E.; and Hinshaw, Pauline S., to Hinshaw, Pauline S. Postural drainage device. 4,170,986, Cl. 128-1.00R.

Hinshaw, Pauline S.: *See*—
Hinshaw, Cecil E.; and Hinshaw, Pauline S., 4,170,986, Cl. 128-1.00R.

Hirano, Isao: *See*—
Tomita, Kenichi; Uehara, Keiichi; Torii, Kenji; Okuda, Takahiro; Katsura, Hakuji; and Hirano, Isao, 4,171,455, Cl. 568-625.000.

Hirko, Ronald J.; and Mills, Harold E., to Occidental Chemical Company. Recovery of calcium fluoride from phosphate operation waste water. 4,171,342, Cl. 423-160.000.

Hirose, Katsuhiro: *See*—
Kyo, Kayomon; Hirose, Katsuhiro; Yasue, Kenji; Tokumitsu, Sinichi; and Kohyama, Haruo, 4,171,330, Cl. 525-180.000.

Hirose, Kiyoshi, to Matsushita Reiki Co., Ltd. Automatic vending machine capable of heating vended goods. 4,171,066, Cl. 221-150.00A.

Hirota, Kosaku: *See*—
Watanabe, Kyoichi A.; Hirota, Kosaku; Chu, Chung K.; Reichman, Uri; and Fox, Jack J., 4,171,429, Cl. 536-1.000.

Hirsch, John L.; and Radzins, Edmund A., to Curt G. Joa, Inc. Method and apparatus for applying adhesive attaching tapes to pads. 4,171,239, Cl. 156-461.000.

Hisayuki, Terumi: *See*—
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Hisayuki, Terumi, 4,171,328, Cl. 260-604.00R.

Hitachi Denshi Kabushiki Kaisha: *See*—
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyampto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.

Hitachi, Ltd.: *See*—
Horiuchi, Michimasa; Narita, Hiroshi; and Tsuboi, Takashi, 4,171,506, Cl. 318-338.000.
Hosaka, Nobuyoshi; and Nakazawa, Tetsuo, 4,171,297, Cl. 260-31.20R.
Kiwaki, Hisakatsu; Ibamoto, Masahiko; Suzuki, Masato; Toyama, Jinichi; and Kuriyama, Shigeru, 4,171,510, Cl. 323-89.00M.
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.
Nohara, Yasumoto; Harada, Yukio; Toyooka, Morio; and Harada, Takashi, 4,171,049, Cl. 206-328.000.

Shima, Seiya; Kuroha, Hiroaki; Takeki, Ando; Inaba, Hiromi; Kurosawa, Toshiaki; Terunuma, Mutsuhiro: and Sakai, Yoshio, 4,171,505, Cl. 318-316.000.
Tanimizu, Shinkichi; Suzuki, Teruki; and Fukuzawa, Tadashi, 4,171,501, Cl. 313-486.000.
Yamaguchi, Kiyoshi; Maki, Naoki; and Mori, Takanobu, 4,171,494, Cl. 310-52.000.
Hobrecht, Alvin J. Vehicle reinforcing bar. 4,171,141, Cl. 280-756.000.
Hockswender, Thomas R.: *See—*
Hartman, Marvis E.; Dowbenko, Rostyslaw; and Hockswender, Thomas R., 4,171,413, Cl. 525-329.000.
Hoddinott, David C.; and Brown, Albert P., to Crompton & Knowles Corporation. Strand cutting mechanism. 4,170,913, Cl. 83-441.000.
Hodge, Dean E.: *See—*
Skoch, Leroy V.; and Hodge, Dean E., 4,171,385, Cl. 426-658.000.
Hodge, F. Galen: *See—*
Asphahani, Aziz I.; Hodge, F. Galen; Leonard, Robert B.; and Schuur, Patrick D., 4,171,217, Cl. 75-122.000.
Hoechst Aktiengesellschaft: *See—*
Frommeld, Hans-Dieter, 4,171,222, Cl. 96-75.000.
Ohorodnik, Alexander; Kaiser, Karl; and Wesselmann, Rudolf, 4,171,427, Cl. 528-500.000.
Hoeksema, Herman, to Upjohn Company, The. Novel degradation products of rubradirin and rubradirin B and process for such degradation. 4,171,436, Cl. 544-99.000.
Hoeksema, Herman, to Upjohn Company, The. Novel degradation products of rubradirin and rubradirin B. 4,171,437, Cl. 544-99.000.
Hoffend, Thomas R.: *See—*
Eddy, Clifford O.; and Hoffend, Thomas R., 4,170,957, Cl. 118-60.000.
Hoffmann-La Roche Inc.: *See—*
Chan, Ka-Kong; and Pawson, Beverly A., 4,171,318, Cl. 260-404.000.
Hoheisel, Peter-Matthias; and Komander, Gerhard, to Daimler-Benz AG. Ignition device for a passive retention system. 4,170,939, Cl. 102-28.00S.
Hohlein, Peter: *See—*
Dhein, Rolf; Hohlein, Peter; Kuchenmeister, Rolf; and Beer, Wolfgang, 4,171,294, Cl. 260-22.0CQ.
Holmes, Francis A., to Electric Power Research Institute, Inc. Current interrupter electrode configuration. 4,171,474, Cl. 200-144.00B.
Holmes, Horace D. Locking thread construction. 4,171,012, Cl. 151-14.00R.
Holstein, Siegbert, to Dr. Johannes Heidenhain GmbH. Longitudinal measuring device with longitudinally displaceable scale. 4,170,826, Cl. 33-125.00C.
Holte, Johan B.: *See—*
Harang, Hakon; Widding, Karl; Andreassen, Knut A.; and Holte, Johan B., 4,171,247, Cl. 204-34.000.
Holzbaur, Siegfried: *See—*
Wessel, Wolf; Grieshaber, Hermann; and Holzbaur, Siegfried, 4,170,975, Cl. 123-139.0AW.
Honeycutt, Fred L., Jr.; and Senterfitt, Donald R., to United States of America, Air Force. Durability flap and seal liner assembly for exhaust nozzles. 4,171,093, Cl. 239-127.300.
Hooker Chemicals & Plastics Corp.: *See—*
Emmett, John E., 4,170,926, Cl. 92-212.000.
Horii, Hideo: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,171,308, Cl. 260-31.2MR.
Horiuchi, Michimasa; Narita, Hiroshi; and Tsuboi, Takashi, to Hitachi, Ltd. Control apparatus for an electric car. 4,171,506, Cl. 318-338.000.
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., to Bristol-Myers Company. 0-2-Isocephem-4-carboxylic acid derivatives as antibacterial agents. 4,171,438, Cl. 544-105.000.
Horvath, Kalman; and Erenyi, Bruno, to Szerszamgepipari Muvek. Apparatus for copy machining having a manual control. 4,170,850, Cl. 51-165.00R.
Hosaka, Nobuyoshi; and Nakazawa, Tetsuo, to Hitachi Ltd. Anti-crevice corrosion sealants for metals. 4,171,297, Cl. 260-31.20R.
Hoshino, Taiji; Okubo, Masao; and Miki, Masayoshi, to Sumitomo Chemical Company, Limited. Anticorrosive bellows. 4,171,218, Cl. 75-128.00C.
Houpt, Grover K., to American Manufacturing Company, Inc. Modular programmable controlling system. 4,171,541, Cl. 364-900.000.
Howard, James S.; and Ortiz, Joseph F., to Spil-Les. Covered drinking cup. 4,171,060, Cl. 220-254.000.
Huber, Guntram; Hutai, Hubert; Klie, Wolfgang; Fischer, Wolfgang; Heim, Reinhold; and Labatze, Wolfgang, to Daimler-Benz AG. Bumper for a motor vehicle. 4,171,143, Cl. 293-121.000.
Hudson, Frederick W., to Vencraft Corporation. Signal device. 4,171,086, Cl. 232-35.000.
Hudson, James N., to Molded Products Company. Blower motor mounting assembly. 4,171,190, Cl. 417-350.000.
Hudson's Bay Oil and Gas Company Limited: *See—*
Jagodzinski, Richard F.; and Wahl, Edward L., 4,171,200, Cl. 432-13.000.
Huebner, Klaus: *See—*
Elser, Wilhelm; Huebner, Klaus; Ottofrickenstein, Hans; and Bossler, Hans, 4,171,407, Cl. 428-500.000.
Hughes Aircraft Company: *See—*
Fraas, Lewis M.; Zanio, Kenneth R.; and Knechtli, Ronald C., 4,171,235, Cl. 148-175.000.
Pinnow, Douglas A.; and Gentile, Anthony L., 4,170,997, Cl. 128-395.000.
Wang, Chi-Shin; and Jiang, Ching-Lin, 4,171,521, Cl. 340-347.0AD.
Hugin, Hans, to Bautex Adolf Stover KG. Device for terminating rotary movement of a driven shaft. 4,171,473, Cl. 200-47.000.
Huhn, Magda; Szabo, Gabor; Resofszki, Gabor; and Somfai, Eva, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for the preparation of reactive penicillanic acid and cephalosporanic acid derivatives. 4,171,303, Cl. 260-239.100.
Hukuba Kogyo Kabushiki Kaisha: *See—*
Saito, Gunsei, 4,170,803, Cl. 15-144.00R.
Hulshof, Jacques A. M.: *See—*
Lorteije, Jean H. J.; Warrink, Geert; deVries, Gerhard H. F.; and Hulshof, Jacques A. M., 4,171,524, Cl. 340-713.000.
Humber, Leslie G.: *See—*
Asselin, Andre A.; and Humber, Leslie G., 4,171,443, Cl. 546-66.000.
Hunt, Clive W., to Compair Sa (Proprietary) Limited. Hydraulically powered percussive apparatus. 4,170,924, Cl. 91-232.000.
Hunt, Delbert R. Transfer sheet. 4,171,398, Cl. 428-195.000.
Hunt, Robert P., to Diagnostic Information. Automatic brightness control for direct view fluoroscopic imaging systems. 4,171,484, Cl. 250-355.000.
Hurst, Kerney J. Circuitry and system for controlling multi-use article dispensing cells. 4,171,065, Cl. 221-7.000.
Hutai, Hubert: *See—*
Huber, Guntram; Hutai, Hubert; Klie, Wolfgang; Fischer, Wolfgang; Heim, Reinhold; and Labatze, Wolfgang, 4,171,143, Cl. 293-121.000.
Hydronix, Inc.: *See—*
Chapman, Floyd A., 4,171,186, Cl. 417-17.000.
Hymans, Nelson J. Apparatus and method for connecting an end of a horizontal beam to a vertical surface of supporting structure. 4,171,173, Cl. 403-189.000.
Ibamoto, Masahiko: *See—*
Kiwaki, Hisakatsu; Ibamoto, Masahiko; Suzuki, Masato; Toyama, Jinichi; and Kuriyama, Shigeru, 4,171,510, Cl. 323-89.00M.
Ichikizaki, Tetsuo: *See—*
Tanimoto, Tateo; Hiasa, Yukio; Tsukamoto, Hidehiko; Ichikizaki, Tetsuo; Shindo, Akihiro; and Wakayama, Akira, 4,170,889, Cl. 72-85.000.
Ichimatsu, Eiji: *See—*
Onishi, Kimimasa; Ichimatsu, Eiji; Nagashima, Mamoru; Suekane, Junnosuke; and Ogawa, Mikiyoshi, 4,171,008, Cl. 139-339.000.
ICI Australia Limited: *See—*
Stubbs, Vincent K.; Downing, Francis S.; and Marrs, Gordon J., 4,171,355, Cl. 424-174.000.
Ikushige, Tetsuo: *See—*
Matsushita, Susumu; and Ikushige, Tetsuo, 4,171,430, Cl. 536-8.000.
Imperial Chemical Industries Limited: *See—*
Balasubramanyan, Sugavanam; and Shephard, Margaret C., 4,171,214, Cl. 71-92.000.
Smith, Leslie H., 4,171,374, Cl. 424-304.000.
Inaba, Hiromi: *See—*
Shima, Seiya; Kuroha, Hiroaki; Takeki, Ando; Inaba, Hiromi; Kurosawa, Toshiaki; Terunuma, Mutsuhiro; and Sakai, Yoshio, 4,171,505, Cl. 318-316.000.
Inficon Leybold-Heraeus Inc.: *See—*
Morgan, Michael J., 4,171,341, Cl. 422-98.000.
Ingham, Steve F. Coin operated lotion dispensing apparatus. 4,171,039, Cl. 194-9.00T.
Inland Steel Company: *See—*
Patil, Ram S.; and Jones, Frederick F., Jr., 4,171,394, Cl. 427-374.00C.
Sievert, William C.; Cundiff, James B.; Klobuchar, Peter A.; Lindberg, Larry H.; and Kargol, James A., 4,171,392, Cl. 427-321.000.
Institute of Gas Technology: *See—*
Klass, Donald L., 4,171,017, Cl. 166-266.000.
Institutul de Cercetari Si Proiectari Pentru Petrol Si Gaze: *See—*
Cucuiat, Iulius M.; and Popp, Vasile V., 4,171,349, Cl. 423-574.00L.
Instytut Mechaniki Precyzyjnes: *See—*
Tuznik, Franciszek; and Lis, Andrzej, 4,171,255, Cl. 204-238.000.
International Business Machines Corporation: *See—*
Funari, Joseph, 4,171,477, Cl. 219-56.210.
Heuer, Dale A.; Schloss, Phillip C.; and Schroeder, Larry L., 4,171,536, Cl. 364-200.000.
Liu, Cheng-Yih, 4,171,242, Cl. 156-657.000.
Osborne, Edward T.; and Van Hook, Danny A., 4,171,527, Cl. 346-75.000.
Peter, Anthony E.; Shott, Frank A.; and Weiss, Robert L., 4,170,819, Cl. 29-625.000.
Simi, Victor M.; and Soderman, Donald A., 4,171,229, Cl. 148-1.500.
International Diagnostics Tech. Inc.: *See—*
Araps, Constance J., 4,171,311, Cl. 260-326.340.
International Electric Co.: *See—*
Parkitny, Felix, 4,171,523, Cl. 340-654.000.
International Telephone and Telegraph Corporation: *See—*
Kling, Harry C., 4,171,528, Cl. 357-13.000.
INTERx Research Corporation: *See—*
Kaminski, James J.; and Bodor, Nicolae S., 4,171,452, Cl. 560-253.000.
Irvine, Robert; and Luperti, Harry E., to Pitney-Bowes, Inc. Document feeder for a copier. 4,171,128, Cl. 271-3.000.
Ishida, Takuo; and Ban, Masuo, to Shimano Industrial Company Limited. Spinning type fishing reel. 4,171,108, Cl. 242-84.20G.
Ishikawa, Shinzo: *See—*
Shono, Hiroaki; Nakazawa, Koji; and Ishikawa, Shinzo, 4,171,212, Cl. 65-11.00R.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Aizu, Shoichi; and Shimizu, Masami, 4,171,137, Cl. 277-25.000.
Isowa, Eiji: *See*—
Motegi, Akira; Isowa, Eiji; and Kimura, Kaoru, 4,171,416, Cl. 526-245.000.
Italiana Prefabbricazione Edile S.p.A.: *See*—
Goretti, Cesare, 4,171,194, Cl. 425-88.000.
ITT Industries, Inc.: *See*—
Burth, Rolf D., 4,171,492, Cl. 307-310.000.
Ivoilov, Oleg G.: *See*—
Zhukov, Evgeny I.; Kichulkin, Viktor A.; Tsernes, Vladimir Y.; Shekhel, Alexandr B.; Kershenbaum, Naum Y.; Senderov, Evgeny N.; and Ivoilov, Oleg G., 4,170,944, Cl. 104-138.00R.
J. O. & R. H. Baird Limited: *See*—
Baird, Robert A.; and Baird, James E., 4,170,813, Cl. 29-281.300.
J. P. Stevens & Co., Inc.: *See*—
Pike, Herbert J., 4,170,865, Cl. 57-6.000.
Jacobson, Stephen E.: *See*—
Mares, Frank; Jacobson, Stephen E.; and Tang, Reginald T., 4,171,313, Cl. 260-343.000.
Jagodzinski, Richard F.; and Wahl, Edward L., to Hudson's Bay Oil and Gas Company Limited. Process and apparatus for in situ melting of sulphur from solid sulphur storage block. 4,171,200, Cl. 432-13.000.
Jahnig, Charles E. Energy conversion system for deriving useful power from sources of low level heat. 4,170,878, Cl. 60-641.000.
Jakobi, Gunter: *See*—
Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, 4,171,278, Cl. 252-102.000.
Janes, George S.; Litzenberger, Leonard N.; and Twombly, Donald F., to Jersey Nuclear-Avco Isotopes, Inc. Linear electron beam gun evaporator having uniform electron emission. 4,171,462, Cl. 13-31.0EB.
Janome Sewing Machine Co., Ltd.: *See*—
Ozaki, Yoshiaki, 4,170,950, Cl. 112-158.00F.
Jehn, Thomas C.; Roraff, Francis J.; and Bauers, Gerald T., to Trane Company, The. Water-tube boiler. 4,170,964, Cl. 122-235.00G.
Jenkins, Cecil: *See*—
Woolslayer, Homer J.; Woods, Robert D.; and Jenkins, Cecil, 4,171,032, Cl. 182-3.000.
Jenny, Bernard T.: *See*—
Wagstaff, Robert A.; Jenny, Bernard T.; and Risser, Roger L., 4,171,180, Cl. 414-502.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Janes, George S.; Litzenberger, Leonard N.; and Twombly, Donald F., 4,171,462, Cl. 13-31.0EB.
Jeschke, Henning; and Bruchmann, Winfried, to Licentia Patent-Verwaltungs-G.m.b.H. Control of withdrawal of flat items individually from a stack. 4,171,130, Cl. 271-10.000.
Jiang, Ching-Lin: *See*—
Wang, Chi-Shin; and Jiang, Ching-Lin, 4,171,521, Cl. 340-347.0AD.
Jimenez, James A.; Aguirre, Alfred A.; and Reyes, Apolonio, to Aguirre, Alfred A.; and Reyes, Apolonio. Material extruding apparatus. 4,171,198, Cl. 425-377.000.
Joh. A. Benckiser GmbH: *See*—
Dankworth, Juergen; Hartenstein, Helmut; and Hertling, Ludwig, 4,171,277, Cl. 252-99.000.
Johns-Manville Corporation: *See*—
Sadler, Thomas H.; and Dalton, John J., 4,171,238, Cl. 156-173.000.
Johnson & Johnson: *See*—
Smyth, Milagros B.; and Lee-You, James, 4,170,823, Cl. 32-8.000.
Johnson, Richard D.: *See*—
Carrico, Robert J.; and Johnson, Richard D., 4,171,432, Cl. 536-26.000.
Johnston, Larry C., to Emmert Mfg. Co., Inc. Auxiliary implement mount. 4,171,172, Cl. 403-71.000.
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, to Merck Patent Gesellschaft mit beschraenkter Haftung. Phenoxy-amino-propanols. 4,171,370, Cl. 424-282.000.
Jones, Frederick F., Jr.: *See*—
Patil, Ram S.; and Jones, Frederick F., Jr., 4,171,394, Cl. 427-374.00C.
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., to Betz Laboratories, Inc. Compositions for treating aqueous mediums containing magnesium sulfite trihydrate. 4,171,292, Cl. 260-29.6WB.
Jones, Ronald B. Long handled liquid dispensing applicator. 4,171,171, Cl. 401-150.000.
Jordan, Vernon J.: *See*—
Burroughs, Harold R.; Martin, Willie E.; and Jordan, Vernon J., 4,171,061, Cl. 220-256.000.
Jorde, Joachim: *See*—
Baumgart, Frank; Bensmann, Gunter; Haasters, Jorg; Hartwig, Jurgen; Jorde, Joachim; Muller, Manfred; and Schlegel, Karl F., 4,170,990, Cl. 128-92.00B.
Joy Manufacturing Company: *See*—
Cathcart, Gregory D., 4,170,907, Cl. 81-57.110.
Peveto, John E.; and Cathcart, Gregory D., 4,170,908, Cl. 81-57.110.
Joyes, John F., to Lucas Industries Limited. Electric vehicle traction motor control. 4,171,507, Cl. 318-345.00C.
Junca, Gerard: *See*—
Legrix, Georges; Junca, Gerard; Bouron, Michel; and Rustul, Pierre, 4,171,401, Cl. 428-369.000.
Jung, Rainer, to Robert Bosch GmbH. Testing opaque workpieces, particularly tiny or thin elongated objects such as pins, bolts, wires, or the like, for orientation, size and material integrity. 4,171,161, Cl. 356-383.000.
Junkunc Bros. American Lock Company: *See*—
Calegan, Everett L., 4,170,884, Cl. 70-21.000.
Jyojiki, Masao; and Nakamura, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Method and apparatus for focusing a photographic apparatus. 4,171,155, Cl. 354-25.000.
Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,170,938, Cl. 101-111.000.
Kageyama, Hidehei; and Suzuki, Takahiko, to Kotobuki & Co., Ltd. Automatic pencil. 4,171,170, Cl. 401-65.000.
Kaiser, Karl: *See*—
Ohorodnik, Alexander; Kaiser, Karl; and Wesselmann, Rudolf, 4,171,427, Cl. 528-500.000.
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, to Nippon Oil Co. Ltd. Water-soluble coating composition. 4,171,308, Cl. 260-31.2MR.
Kallqvist, Ulf G.: *See*—
Gustafsson, Lars; and Kallqvist, Ulf G., 4,170,807, Cl. 24-137.00R.
Kaminski, James J.; and Bodor, Nicolae S., to INTERx Research Corporation. Antibacterially active N-chloroamino ester derivatives of alkyl carboxylates. 4,171,452, Cl. 560-253.000.
Kampe, Wolfgang: *See*—
Wiedemann, Fritz; and Kampe, Wolfgang, 4,171,446, Cl. 548-372.000.
Kanno, Youji: *See*—
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.
Kano, Toshitaka: *See*—
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.
Karakawa, Takuro: *See*—
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.
Kargol, James A.: *See*—
Sievert, William C.; Cundiff, James B.; Klobuchar, Peter A.; Lindberg, Larry H.; and Kargol, James A., 4,171,392, Cl. 427-321.000.
Karm, Robert, to Etablissements Martel, Catala & Cie S.A. Forming fabrics for paper-making machines and methods of manufacture thereof. 4,171,009, Cl. 139-425.00A.
Kartridg Pak Co., The: *See*—
Groves, William H.; and Donovan, Andrew E., 4,171,164, Cl. 366-152.000.
Karz, Robert S.: *See*—
Schwarz, William M.; Karz, Robert S.; Erhardt, Peter F.; and Dickerson, Charles G., 4,171,274, Cl. 252-62.10P.
Kashihara, Takanobu: *See*—
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,171,340, Cl. 422-36.000.
Kassai Kabushiki Kaisha: *See*—
Kassai, Kenzou, 4,171,132, Cl. 272-70.300.
Kassai, Kenzou, to Kassai Kabushiki Kaisha. Infant walking trainer. 4,171,132, Cl. 272-70.300.
Katagiri, Masayoshi: *See*—
Souma, Teruo; and Katagiri, Masayoshi, 4,171,037, Cl. 188-73.500.
Katsanis, Eleftherios P.: *See*—
Derolf, M. Robert; and Katsanis, Eleftherios P., 4,171,227, Cl. 106-85.000.
Katsura, Hakuji: *See*—
Tomita, Kenichi; Uehara, Keiichi; Torii, Kenji; Okuda, Takahiro; Katsura, Hakuji; and Hirano, Isao, 4,171,455, Cl. 568-625.000.
Katz, Klaus; Pfundstein, Wolfgang; and Abt, Reinhold, to Daimler-Benz AG. By-pass valve for servo steering systems. 4,170,925, Cl. 91-400.000.
Katz, Maurice; and Wheeler, Kenneth E. Apparatus for measuring hair growth. 4,170,827, Cl. 33-125.00R.
Kaufmann, Jochen: *See*—
Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, 4,171,278, Cl. 252-102.000.
Kawabata, Yasuhiro: *See*—
Yamanaka, Minoru; and Kawabata, Yasuhiro, 4,170,971, Cl. 123-119.00A.
Kayser, Franz; Rauf, Richard; Schmitz, Wimmar; and Schlunke, Jurgen, to Kleinewefers GmbH. Winding-up device for paper webs, especially wide paper webs on a driven cylinder. 4,171,107, Cl. 242-67.10R.
Kayserling, Ulrich, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Motorized railway vehicles. 4,170,945, Cl. 105-133.000.
Kazansky Aviatsionny Institut Imeni A. N. Tupoleva: *See*—
Kunitsyn, Valery A.; and Rakhimkulov, Mirsaid M., 4,171,104, Cl. 241-160.000.
Keith, Carl D., to Engelhard Minerals & Chemicals Corporation. Catalyst compositions and the method of manufacturing them. 4,171,287, Cl. 252-462.000.
Keith, Carl D.; Larsen, William R.; and Shimrock, Thomas, to Engelhard Minerals & Chemicals Corporation. Catalyst compositions and the method of manufacturing them. 4,171,288, Cl. 252-462.000.
Kella, Harry Y. Seat bib. 4,170,991, Cl. 128-134.000.
Keller, Pat N.: *See*—
Silberberg, George G.; Keller, Pat N.; and White, Richard O., 4,171,529, Cl. 358-209.000.
Kempler, Ernest: *See*—
Winn, Ronald R., 4,171,052, Cl. 211-162.000.

Kempton, Edward A. Water removal system for gas wells. 4,171,016, Cl. 166-68.000.
Kennedy, James V.: *See—*
Dight, Lawrence B.; and Kennedy, James V., 4,171,286, Cl. 252-455.00Z.
Kernforschungsanlage Julich GmbH: *See—*
Bailitis, Eduard, 4,170,892, Cl. 73-23.000.
Kershenbaum, Naum Y.: *See—*
Zhukov, Evgeny I.; Kichulkin, Viktor A.; Tsernes, Vladimir Y.; Shekhel, Alexandr B.; Kershenbaum, Naum Y.; Senderov, Evgeny N.; and Ivoilov, Oleg G., 4,170,944, Cl. 104-138.00R.
Kervalishvili, Zurab Y.: *See—*
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.
Kesling, Haven S., Jr.; and Zehner, Lee R., to Atlantic Richfield Company. Preparation of unsaturated diesters by catalytic oxidative carbonylation of diolefins. 4,171,450, Cl. 560-204.000.
Kessl, Werner. Use of silicon carbide as an addition to cupola furnaces. 4,171,219, Cl. 75-130.00R.
Kettenbach, Fritz: *See—*
Friess, Hans; Kettenbach, Fritz; Farber, Jurgen; Witter, Karl T.; and Strole, Ulrich, 4,171,064, Cl. 220-418.000.
Kharkovsky Politekhnichesky Institut: *See—*
Baranov, Mikhail I., 4,170,887, Cl. 72-56.000.
Khlopkov, Leonid P.: *See—*
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.
Kichulkin, Viktor A.: *See—*
Zhukov, Evgeny I.; Kichulkin, Viktor A.; Tsernes, Vladimir Y.; Shekhel, Alexandr B.; Kershenbaum, Naum Y.; Senderov, Evgeny N.; and Ivoilov, Oleg G., 4,170,944, Cl. 104-138.00R.
Killian, Gerald I. Archery bow arrow rest. 4,170,980, Cl. 124-41.00A.
Kilmer, LeMoyne L., to United States of America, Air Force. Launch lug retractor assembly. 4,170,923, Cl. 89-1.819.
Kim, Sang H.: *See—*
Hamblen, David P.; Glover, Clyde P.; and Kim, Sang H., 4,171,246, Cl. 204-1.00T.
Kimura, Kaoru: *See—*
Motegi, Akira; Isowa, Eiji; and Kimura, Kaoru, 4,171,416, Cl. 526-245.000.
King, Larry K.; and Hardwick, Roy E., to Aluminum Company of America. Reactor heater. 4,171,346, Cl. 423-496.000.
Kinzel, Richard: *See—*
Kopse, Odon; Kinzel, Richard; Eblen, Ewald; Voit, Willi; Schuster, Gregor; and Eheim, Franz, 4,171,099, Cl. 239-533.800.
Kiprich, Nikolai A.: *See—*
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.
Kish, Richard E.; and Rastorguyeff, Andrew W., to Pitney-Bowes, Inc. Apparatus for collating pages of multi-up printed documents. 4,171,127, Cl. 270-58.000.
Kiwaki, Hisakatsu; Ibamoto, Masahiko; Suzuki, Masato; Toyama, Jinichi; and Kuriyama, Shigeru, to Hitachi, Ltd. System for detecting output of controllable semiconductor device. 4,171,510, Cl. 323-89.00M.
Klass, Donald L., to Institute of Gas Technology. Method of gas production from geopressurized geothermal brines. 4,171,017, Cl. 166-266.000.
Kleeman, Axel: *See—*
Beschke, Helmut; Friedrich, Heinz; and Kleeman, Axel, 4,171,444, Cl. 546-250.000.
Klein, Imrich: *See—*
Klein, Reuben; Klein, Imrich; and Cidon, Yigal, 4,171,195, Cl. 425-141.000.
Klein, Joseph F. M.; Stijfs, Petrus A. M. J.; and Thoma, Jozef A., to Stamicarbon, B.V. Process for preparing 2-(1-cyclohexenyl)-cyclohexanone. 4,171,326, Cl. 260-586.00C.
Klein, Reuben; Klein, Imrich; and Cidon, Yigal, to Scientific Process & Research, Inc. Cross-head die with volumetric flow compensation means. 4,171,195, Cl. 425-141.000.
Kleiner, Eduard K.; and Dear, Robert E. A., to Ciba-Geigy Corporation. Polymers of unsaturated esters of polyfluoroalkylthioalcohols. 4,171,415, Cl. 526-243.000.
Kleinewefers GmbH: *See—*
Kayser, Franz; Rauf, Richard; Schmitz, Wimmar; and Schlunke, Jurgen, 4,171,107, Cl. 242-67.10R.
Kleiss, Louis D., to Phillips Petroleum Company. Sloping baseline compensation for a chromatographic analyzer. 4,170,893, Cl. 73-23.100.
Klie, Wolfgang: *See—*
Huber, Guntram; Hutai, Hubert; Klie, Wolfgang; Fischer, Wolfgang; Heim, Reinhold; and Labatze, Wolfgang, 4,171,143, Cl. 293-121.000.
Kliger, Gilbert L. Oncotic pressure measurement cell. 4,170,895, Cl. 73-64.300.
Kling, Harry C., to International Telephone and Telegraph Corporation. Solderable zener diode. 4,171,528, Cl. 357-13.000.
Klobuchar, Peter A.: *See—*
Sievert, William C.; Cundiff, James B.; Klobuchar, Peter A.; Lindberg, Larry H.; and Kargol, James A., 4,171,392, Cl. 427-321.000.
Klose, Karl W., to Cooper Tire and Rubber Company. Apparatus for assembling a ferrule with a sleeve member. 4,170,820, Cl. 29-789.000.
Kluender, Harold C.: *See—*
Biddlecom, William G.; Kluender, Harold C.; and Woessner, Warren D., 4,171,331, Cl. 260-946.000.
Knechtli, Ronald C.: *See—*
Fraas, Lewis M.; Zanio, Kenneth R.; and Knechtli, Ronald C., 4,171,235, Cl. 148-175.000.
Knepper, Wilhelm: *See—*
Muller, Dieter J.; and Knepper, Wilhelm, 4,171,324, Cl. 260-513.00B.
Knopf, Robert J.: *See—*
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,171,423, Cl. 528-289.000.
Knowles, Alfred E., to Rath, Harlan J. Belt buckle assembly having an image formed on a photosensitive face plate thereof. 4,170,808, Cl. 24-163.00K.
Kobashi, Kiyoshi: *See—*
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,170,973, Cl. 123-119.00A.
Koenecke, Donald F., to Exxon Research & Engineering Co. Shielded anodes. 4,171,254, Cl. 204-197.000.
Kohaut, John E., to Raceway Components, Inc. Insert void forming device. 4,170,853, Cl. 52-99.000.
Kohyama, Haruo: *See—*
Kyo, Kayomon; Hirose, Katsuhiro; Yasue, Kenji; Tokumitsu, Sinichi; and Kohyama, Haruo, 4,171,330, Cl. 525-180.000.
Kojima, Toyoo, to Hidaka Engineering Company, Limited. Punch and die assembly for use in the production of heat exchanger fins. 4,170,890, Cl. 72-359.000.
Koleske, Joseph V.: *See—*
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,171,423, Cl. 528-289.000.
Komander, Gerhard: *See—*
Hoheisel, Peter-Matthias; and Komander, Gerhard, 4,170,939, Cl. 102-28.00S.
Komarov, Boris V.: *See—*
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.
Komatsu, Kyoichi, to Otsuka Pharmaceutical Factory, Inc. Plastic containers for parenteral solutions. 4,170,994, Cl. 128-214.00C.
Kongo Co., Ltd.: *See—*
Taniwaki, Genshi, 4,170,848, Cl. 49-358.000.
Koniz, Leon F.; and Estes, John H., to Texaco Inc. Novel method for dealkylating alkylaromatic hydrocarbons. 4,171,329, Cl. 585-487.000.
Kopal Oy: *See—*
Naykki, Niilo, 4,171,478, Cl. 219-400.000.
Kopin, Sheldon A., to 'Totes', Incorporated. Handbag. 4,171,011, Cl. 150-34.000.
Kopse, Odon; and Kuschmierz, Heinz, to Robert Bosch GmbH. High pressure fuel injection system. 4,170,974, Cl. 123-139.0AT.
Kopse, Odon; Kinzel, Richard; Eblen, Ewald; Voit, Willi; Schuster, Gregor; and Eheim, Franz, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,171,099, Cl. 239-533.800.
Korkosz, Gregory J., to Summa Corporation. Balancing of high-speed shafts. 4,170,896, Cl. 73-66.000.
Kosobutsky, Alexandr A.: *See—*
Sakulevich, Faddei J.; and Kosobutsky, Alexandr A., 4,170,849, Cl. 51-7.000.
Kotobuki & Co., Ltd.: *See—*
Kageyama, Hidehei; and Suzuki, Takahiko, 4,171,170, Cl. 401-65.000.
Kovacs, Istvan: *See—*
Benedek, Gyorgy; Bese, Andras; Domokos, Jozsef; and Kovacs, Istvan, 4,171,100, Cl. 239-700.000.
Krassoulia, Georges: *See—*
Reichard, Michel; and Krassoulia, Georges, 4,170,941, Cl. 102-202.000.
Krause, Nicolaas J. P. R. Therapeutic apparatus. 4,170,988, Cl. 128-24.00R.
Krauss-Maffei Aktiengesellschaft: *See—*
Seit, Horst; and Schlegl, Eugen, 4,171,027, Cl. 180-9.540.
Krbechek, LeRoy O., to Henkel Corporation. Selective conversion of 20-methylpregna-3,5,20(21)-triene-3,21-diol-diacetate to 3-oxo-20-methylpregna-4,20(21)-diene-21-yl-acetate. 4,171,317, Cl. 260-397.470.
Krueger, Wallace F. Apparatus for transferring metered quantities of material from one location to another. 4,171,191, Cl. 417-539.000.
Krumdieck, Carlos L., to University of Alabama in Birmingham. Apparatus for homogenizing and handling biowaste and other materials in isolation. 4,170,798, Cl. 4-319.000.
Kubens, Rolf: *See—*
Meyer, Frank; Kubens, Rolf; and Winkelmann, Martin, 4,171,419, Cl. 528-67.000.
Kubota, Ltd.: *See—*
Tanaka, Ryoichi; and Adachi, Tadao, 4,171,054, Cl. 414-687.000.

Kuchenmeister, Rolf: *See*—
Dhein, Rolf; Hohlein, Peter; Kuchenmeister, Rolf; and Beer, Wolfgang, 4,171,294, Cl. 260-22.0CQ.

Kuehnel, Werner, to Siemens Aktiengesellschaft. X-ray diagnosis generator comprising an inverter feeding the high voltage transformer. 4,171,488, Cl. 250-421.000.

Kuhn, Leroy B., to Stauffer Chemical Company. Method for manufacturing plastisol resins using spray-drying. 4,171,428, Cl. 528-502.000.

Kumagai, Moriji, to Yugen-Gaisha Waikei Giken. Window glass-cleaning device. 4,170,805, Cl. 15-321.000.

Kummer, Rudolf; Schneider, Heinz-Walter; Platz, Rolf; Magnussen, Peter; and Weiss, Franz-Josef, to BASF Aktiengesellschaft. Manufacture of butanedicarboxylic acid esters. 4,171,451, Cl. 560-204.000.

Kunitsyn, Valery A.; and Rakhimkulov, Mirsaid M., to Kazansky Aviatsionny Institut Imeni A. N. Tupoleva. Apparatus for conveying and transmuting metal chips. 4,171,104, Cl. 241-160.000.

Kunz, Bernard L., to Emerson Electric Co. Control valve. 4,171,087, Cl. 236-68.00R.

Kuraray Co., Ltd.: *See*—
Nakashima, Toshihide; and Takakura, Koichi, 4,171,283, Cl. 252-428.000.

Kurita Machinery Manufacturing Company Limited: *See*—
Kurita, Tetsuya; and Miyano, Muneyuki, 4,171,266, Cl. 210-230.000.

Kurita, Tetsuya; and Miyano, Muneyuki, to Kurita Machinery Manufacturing Company Limited. Reciprocally driven apparatus for transporting filter plates in filter press. 4,171,266, Cl. 210-230.000.

Kuriyama, Shigeru: *See*—
Kiwaki, Hisakatsu; Ibamoto, Masahiko; Suzuki, Masato; Toyama, Jinichi; and Kuriyama, Shigeru, 4,171,510, Cl. 323-89.00M.

Kuroha, Hiroaki: *See*—
Shima, Seiya; Kuroha, Hiroaki; Takeki, Ando; Inaba, Hiromi; Kurosawa, Toshiaki; Terunuma, Mutsuhiro; and Sakai, Yoshio, 4,171,505, Cl. 318-316.000.

Kurosawa, Toshiaki: *See*—
Shima, Seiya; Kuroha, Hiroaki; Takeki, Ando; Inaba, Hiromi; Kurosawa, Toshiaki; Terunuma, Mutsuhiro; and Sakai, Yoshio, 4,171,505, Cl. 318-316.000.

Kuschmierz, Heinz: *See*—
Kopse, Odon; and Kuschmierz, Heinz, 4,170,974, Cl. 123-139.0AT.

Kusters, Eduard: *See*—
Moser, Manfred, 4,170,958, Cl. 118-325.000.

Kwon, Young D. Electrodeless fluorescent lamp. 4,171,503, Cl. 315-248.000.

Kyo, Kayomon; Hirose, Katsuhiro; Yasue, Kenji; Tokumitsu, Sinichi; and Kohyama, Haruo, to Unitika Ltd. Fire-retardant resin composition. 4,171,330, Cl. 525-180.000.

Kyrklund, Ben, to Stal-Laval Turbin AB. Gas turbine unit. 4,170,874, Cl. 60-39.18C.

Labatze, Wolfgang: *See*—
Huber, Guntram; Hutai, Hubert; Klie, Wolfgang; Fischer, Wolfgang; Heim, Reinhold; and Labatze, Wolfgang, 4,171,143, Cl. 293-121.000.

Lackey, William W.: *See*—
Conkle, James P.; Lackey, William W.; and Martin, Charles L., 4,170,901, Cl. 73-421.50R.

Lacombat, Michel: *See*—
Gerard, Rene; and Lacombat, Michel, 4,171,162, Cl. 356-401.000.

La Conti, Anthony B.: *See*—
Nolan, Mary E.; La Conti, Anthony B.; and Dempsey, Russell M., 4,171,253, Cl. 204-195.00S.

Laing, Ingeborg: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,170,879, Cl. 60-648.000.

Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver. Method and system for utilizing waste heat generated in thermal electric power stations. 4,170,879, Cl. 60-648.000.

Laing, Oliver: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,170,879, Cl. 60-648.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,171,045, Cl. 198-853.000.

Lalancette, Lionel. Electronic toaster control. 4,170,932, Cl. 99-326.000.

Lamerant, Jean M.; Cohen, Joseph; and Maurel, Pierre, to Aluminium Pechiney. Process for obtaining an aluminum sulfate hydrate from an impure sulfuric acid solution of aluminum sulfate. 4,171,205, Cl. 23-296.000.

Lamson, William C. Fluid flow valve stem. 4,171,119, Cl. 251-321.000.

Landau, Gunter, to Robert Bosch GmbH. System for the electronic editing of video signals. 4,171,530, Cl. 360-70.000.

Lang, Udo; Gruber, Franz; Anand, Satish; and Lehmer, Wilhelm, to Linde Aktiengesellschaft. Method of and apparatus for the concentration of crystallizable liquid. 4,170,881, Cl. 62-538.000.

Lange, Hellmuth: *See*—
Birkenfeld, Richard; Aka, Peter; and Lange, Hellmuth, 4,171,179, Cl. 414-85.000.

Lapeyre, James M., to Laitram Corporation, The. Raised link modular conveyor belt. 4,171,045, Cl. 198-853.000.

LaRos Equipment Company, Inc.: *See*—
Rossio, John H., 4,171,044, Cl. 198-834.000.

Larsen, Ole J. F. System for depositing and protecting sand and other littoral draft material. 4,171,174, Cl. 405-25.000.

Larsen, William R.: *See*—
Keith, Carl D.; Larsen, William R.; and Shimrock, Thomas, 4,171,288, Cl. 252-462.000.

Latassa, Frank M.: *See*—
Cassidy, Robert E.; and Latassa, Frank M., 4,171,519, Cl. 337-25.000.

Latsch, Reinhard, to Robert Bosch GmbH. Ignition chamber for an internal combustion engine. 4,170,979, Cl. 123-32.0SP.

Lattmann, Werner; and Wildbolz, Rudolf, to Rieter Machine Works, Ltd. Apparatus for eliminating metallic contaminations from a fibre transporting duct in spinning preparation. 4,171,262, Cl. 209-555.000.

Lazarus, Stanley D.; Chakravarti, Kalidas; Rowan, Hugh H.; and Neal, James G., to Allied Chemical Corporation. Production of thermally stabilized polyester. 4,171,422, Cl. 528-437.000.

Lazure, Frank S., to Reynolds Metals Company. Method of and apparatus for manually closing foil containers and tool therefor. 4,170,862, Cl. 53-471.000.

LeCraw, Roy C.: *See*—
Gyorgy, Ernst M.; LeCraw, Roy C.; and Wolfe, Raymond, 4,171,389, Cl. 427-130.000.

Lee C. Moore Corporation: *See*—
Woolslayer, Homer J.; Woods, Robert D.; and Jenkins, Cecil, 4,171,032, Cl. 182-3.000.

Lee, Minyoung; Szala, Lawrence E.; and De Vries, Robert C., to General Electric Company. Process for preparing a polycrystalline diamond body/silicon carbide substrate composite. 4,171,339, Cl. 264-332.000.

Lee-You, James: *See*—
Smyth, Milagros B.; and Lee-You, James, 4,170,823, Cl. 32-8.000.

Lefebvre, Jean P., to Northern Telecom Limited. Wire skinning machine. 4,170,906, Cl. 81-9.510.

Legrix, Georges; Junca, Gerard; Bouron, Michel; and Rustul, Pierre, to Legrix, Georges; and Ato Chimie. Artificial straw making stable-litters. 4,171,401, Cl. 428-369.000.

Lehmer, Wilhelm: *See*—
Lang, Udo; Gruber, Franz; Anand, Satish; and Lehmer, Wilhelm, 4,170,881, Cl. 62-538.000.

Leininger, James C., to Phillips Petroleum Company. Spun-like continuous multifilament yarn. 4,170,867, Cl. 57-245.000.

Lekalova, Lidia I.: *See*—
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.

Leonard, Richard L.; and Chernack, Allan D., to Monsanto Company. Method for making a weft and a wig made from the same. 4,171,001, Cl. 132-53.000.

Leonard, Robert B.: *See*—
Asphahani, Aziz I.; Hodge, F. Galen; Leonard, Robert B.; and Schuur, Patrick D., 4,171,217, Cl. 75-122.000.

Leporati, Richard. Charcoal extinguisher. 4,171,020, Cl. 169-49.000.

Leroy, Pierre J., to Creusot-Loire. Process for refining non-ferrous matte. 4,171,216, Cl. 75-76.000.

Leute, Richard K.: *See*—
Blakemore, Judith I.; Leute, Richard K.; and Ernst, Roberta D., 4,171,244, Cl. 435-188.000.

Lever Brothers Company: *See*—
Malhotra, Virender N.; and Mather, John, 4,171,291, Cl. 252-554.000.

Levine, Robert A.; and Wardlaw, Stephen C. Catheter clamp. 4,170,995, Cl. 128-346.000.

Levinstein, Hyman J.: *See*—
Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; Sinha, Ashok K.; and Wang, David N., 4,171,489, Cl. 250-510.000.

Lew, Henry Y., to Chevron Research Company. Nitrobenzene-accelerated lactam polymerization. 4,171,425, Cl. 528-315.000.

Lew, Henry Y., to Chevron Research Company. Triarylmethylhalide-accelerated lactam polymerization. 4,171,426, Cl. 528-312.000.

Lewis, Thomas E.: *See*—
Sideman, Carl E.; and Lewis, Thomas E., 4,171,202, Cl. 8-2.50A.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Jeschke, Henning; and Bruchmann, Winfried, 4,171,130, Cl. 271-10.000.

Liedtke, Larry L.: *See*—
Peterson, Gary L.; and Liedtke, Larry L., 4,170,922, Cl. 89-7.000.

Lieske, Edgar: *See*—
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,171,203, Cl. 8-10.200.

Lim, Gary M. F.: *See*—
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,171,439, Cl. 544-105.000.

Limbaugh, Donald W. Dog or animal retainer device. 4,170,962, Cl. 119-109.000.

Lind, Leif I. Screen for improving the environment of a workplace having a plurality of working areas. 4,170,930, Cl. 98-40.00D.

Lindberg, Larry H.: *See*—
Sievert, William C.; Cundiff, James B.; Klobuchar, Peter A.; Lindberg, Larry H.; and Kargol, James A., 4,171,392, Cl. 427-321.000.

Linde Aktiengesellschaft: *See*—
Lang, Udo; Gruber, Franz; Anand, Satish; and Lehmer, Wilhelm, 4,170,881, Cl. 62-538.000.

Linder, Seymour M., to Alcolac Inc. 1-Hydroxy-2-bromo-3-allyloxypropane. 4,171,457, Cl. 568-674.000.

Lindgren, Bertil. Film cassette opener. 4,171,055, Cl. 414-412.000.

Line Fast Corporation: *See*—
Munsch, Charles; and DiMartino, John M., 4,171,122, Cl. 254-67.000.

Linear International Corporation: *See—*
Brimer, Claude M.; and Von Brimer, Joe W., deceased, 4,171,493, Cl. 310-13.000.
Lings, Barry W.; and Gale, Anthony G., to Rolls-Royce Limited. Rotor blade for a gas turbine engine. 4,171,184, Cl. 416-97.00R.
Lippacher, Wolfgang; Teger, Gerhard; and Reitberger, Rudolf, to Hilti Aktiengesellschaft. Drilling and driving device. 4,171,083, Cl. 227-69.000.
Lis, Andrzej: *See—*
Tuznik, Franciszek; and Lis, Andrzej, 4,171,255, Cl. 204-238.000.
Litton Business Systems, Inc.: *See—*
Sideman, Carl E.; and Lewis, Thomas E., 4,171,202, Cl. 8-2.50A.
Litton Systems, Inc.: *See—*
Buck, Ronald G., 4,171,382, Cl. 426-243.000.
Litzenberger, Leonard N.: *See—*
Janes, George S.; Litzenberger, Leonard N.; and Twombly, Donald F., 4,171,462, Cl. 13-31.0EB.
Liu, Cheng-Yih, to International Business Machines Corporation. Neutral pH silicon etchant for etching silicon in the presence of phosphosilicate glass. 4,171,242, Cl. 156-657.000.
Loeb, Sidney, to Ben Gurion University of the Negev. Method and apparatus for generating power utilizing reverse electrodialysis. 4,171,409, Cl. 429-17.000.
Long, Gordon D., to Tektronix, Inc. Mixer termination for flat frequency response. 4,171,515, Cl. 325-436.000.
Lorteije, Jean H. J.; Warrink, Geert; deVries, Gerhard H. F.; and Hulshof, Jacques A. M., to U.S. Philips Corporation. Display device having a matrix of gas discharge display elements. 4,171,524, Cl. 340-713.000.
Lou, Kwong-Li. Window type air conditioner with sand and dust preclusive means. 4,170,880, Cl. 62-262.000.
Lowder, Dale E., to Clarke-Gravely Corporation. Vacuum cleaner including diverter valve. 4,171,208, Cl. 55-216.000.
Lowe, James A. Conveyor system with object rotator. 4,171,041, Cl. 198-379.000.
Lowrey, Hugh W. Pigment composition for high build protective coating. 4,171,228, Cl. 106-288.00B.
Lucas Industries Limited: *See—*
Joyes, John F., 4,171,507, Cl. 318-345.00C.
Sinclair, Walter, 4,171,508, Cl. 320-2.000.
Luck, Thomas J. Food carrier. 4,171,151, Cl. 312-236.000.
Lund, Kenneth, to Edgar Pickering (Blackburn) Limited. Needle bar for a tufting machine. 4,170,949, Cl. 112-79.00R.
Lundgren, Calvin Q. Sliding door lock. 4,170,885, Cl. 70-97.000.
Luperti, Harry E.: *See—*
Irvine, Robert; and Luperti, Harry E., 4,171,128, Cl. 271-3.000.
Luttsev, Boleslav D.: *See—*
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.
MacDonald, Wayne W.: *See—*
Malvick, Arnold O.; MacDonald, Wayne W.; and Beckwith, Carl M., 4,171,158, Cl. 356-239.000.
Maddox, Lodric L.; and Moon, Soo-Duck P., to Clorox Company, The. Powder percarbonate bleach and formation thereof. 4,171,280, Cl. 252-186.000.
Magic, Susan E.: *See—*
Schwenzer, Kathryn S.; and Magic, Susan E., 4,171,204, Cl. 23-230.00B.
Magnetic Peripherals Inc.: *See—*
Grapes, Robert D.; and Watson, Donald J., 4,171,531, Cl. 360-99.000.
Magnetronic Gesellschaft fur Elektronisch-Mechanisch Gerate mbH & Co. Entwicklungs KG, Firma: *See—*
Herleth, Karl, 4,171,111, Cl. 242-201.000.
Magnussen, Peter: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; Platz, Rolf; Magnussen, Peter; and Weiss, Franz-Josef, 4,171,451, Cl. 560-204.000.
Maier, Sieghart: *See—*
Eckert, Konrad; Maier, Sieghart; and Ritter, Ernst, 4,170,976, Cl. 123-140.0FG.
Maillefer, Charles, to Maillefer S.A. Screw-type plastics extruder. 4,171,196, Cl. 425-209.000.
Maillefer S.A.: *See—*
Maillefer, Charles, 4,171,196, Cl. 425-209.000.
Maki, Naoki: *See—*
Yamaguchi, Kiyoshi; Maki, Naoki; and Mori, Takanobu, 4,171,494, Cl. 310-52.000.
Malhotra, Virender N.; and Mather, John, to Lever Brothers Company. Process for preparing alkane sulfonate detergent compositions. 4,171,291, Cl. 252-554.000.
Mallams, Alan K.: *See—*
Wright, John J.; and Mallams, Alan K., 4,171,356, Cl. 424-180.000.
Malvick, Arnold O.; MacDonald, Wayne W.; and Beckwith, Carl M., to TRI/Valley Growers. Inspection system and method. 4,171,158, Cl. 356-239.000.
Manalastas, Pacifico V.: *See—*
Wagensommer, Joseph; and Manalastas, Pacifico V., 4,171,414, Cl. 526-185.000.
Mann, Herman C.; and Mann, Robert N., to 4M Biological Products and Services. Repeatable fluid dispenser. 4,171,073, Cl. 222-309.000.
Mann, Robert N.: *See—*
Mann, Herman C.; and Mann, Robert N., 4,171,073, Cl. 222-309.000.
Marden, Jay W. Mobile aerial support system. 4,171,114, Cl. 244-116.000.
Mares, Frank; Jacobson, Stephen E.; and Tang, Reginald T., to Allied Chemical Corporation. Molybdenum and tungsten peroxo complexes useful as oxidation catalysts. 4,171,313, Cl. 260-343.000.
Marie, Gerard: *See—*
Dumont, Maurice; and Marie, Gerard, 4,171,088, Cl. 237-2.00B.
Marin, Pierre D.; Prillieux, Marcel; and Tirtiaux, Robert, to Exxon Research & Engineering Co. Surface-active agent. 4,171,323, Cl. 260-501.190.
Marks, Harold C.; and Gillespie, James E., to Norris Industries, Inc. Wheel trim retention means. 4,171,149, Cl. 301-37.00P.
Marquis, Gerald L., to Dresser Industries, Inc. Well logging instrument guide apparatus. 4,171,031, Cl. 181-102.000.
Marrs, Gordon J.: *See—*
Stubbs, Vincent K.; Downing, Francis S.; and Marrs, Gordon J., 4,171,355, Cl. 424-174.000.
Marsai, Maria: *See—*
Tuba, Zoltan; and Marsai, Maria, 4,171,306, Cl. 260-239.55R.
Marshall, J. Howard, to MDH Industries, Inc. Apparatus for analyzing the spectral data in an elemental analyzer measuring gamma rays arising from neutron capture in bulk substances. 4,171,485, Cl. 250-359.000.
Martin, Charles L.: *See—*
Conkle, James P.; Lackey, William W.; and Martin, Charles L., 4,170,901, Cl. 73-421.50R.
Martin, Charles W., to Dow Chemical Company, The. Polyglycolamine corrosion inhibitors. 4,171,279, Cl. 252-148.000.
Martin, Willie E.: *See—*
Burroughs, Harold R.; Martin, Willie E.; and Jordan, Vernon J., 4,171,061, Cl. 220-256.000.
Marvin Glass & Associates: *See—*
Morrison, Howard J.; and Schoenfield, Palmer J., 4,171,133, Cl. 273-127.00C.
Marx, Paul: *See—*
Vetter, Hans; Puschel, Walter; and Marx, Paul, 4,171,220, Cl. 96-29.00D.
Maryland Cup Corporation: *See—*
Doty, William T., 4,171,085, Cl. 229-1.50B.
Maschinenbau "WAM" M. Osterhof KG.: *See—*
Wenzel, Jurgen, 4,171,068, Cl. 226-64.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Kayserling, Ulrich, 4,170,945, Cl. 105-133.000.
Maschinenfabrik E. Mollers GmbH & Co.: *See—*
Birkenfeld, Richard; Thun, Werner; and Aka, Peter, 4,171,178, Cl. 414-45.000.
Birkenfeld, Richard; Aka, Peter; and Lange, Hellmuth, 4,171,179, Cl. 414-85.000.
Masco Corporation of Indiana: *See—*
Nicklas, James R., 4,171,005, Cl. 137-119.000.
Mason, Charles D., to Allied Chemical Corporation. Process for ultra-high molecular weight, high abrasion resistance, cross-linked polyethylene. 4,171,338, Cl. 264-211.000.
Mather, John: *See—*
Malhotra, Virender N.; and Mather, John, 4,171,291, Cl. 252-554.000.
Matovich, Mark A.: *See—*
Benson, Arnold M.; Heath, James E.; and Matovich, Mark A., 4,171,264, Cl. 210-40.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Nagaoka, Tadashi; and Hino, Izumi, 4,171,136, Cl. 274-23.00A.
Nagata, Seiichi; Tanaka, Tsuneo; and Fukai, Masakazu, 4,171,234, Cl. 148-175.000.
Matsushita Electric Works, Ltd.: *See—*
Tatetsuki, Kuniharu; Hanahara, Tohru; Nakano, Takeshi; and Morisue, Kazushige, 4,171,490, Cl. 250-564.000.
Matsushita Reiki Co., Ltd.: *See—*
Hirose, Kiyoshi, 4,171,066, Cl. 221-150.00A.
Matsushita, Susumu; and Ikushige, Tetsuo, to Toyo Soda Manufacturing Co., Ltd. Separation of sweet component from natural sweet extracts. 4,171,430, Cl. 536-8.000.
Maurel, Pierre: *See—*
Lamerant, Jean M.; Cohen, Joseph; and Maurel, Pierre, 4,171,205, Cl. 23-296.000.
Max Frost, Maschinen- und Apparatebau: *See—*
Rossler, Kurt, 4,171,103, Cl. 241-152.00A.
May & Baker Limited: *See—*
Caton, Michael P. L.; Parker, Trevor; and Watkins, Gordon L., 4,171,375, Cl. 424-305.000.
Mayer, Jerome F.: *See—*
O'Rear, Dennis J.; and Mayer, Jerome F., 4,171,257, Cl. 208-120.000.
Mayser-GmbH & Co.: *See—*
Frob, Gerd, 4,171,410, Cl. 521-52.000.
McAfee, Richard C.; and Craig, Jerold A., to SWS Silicones Corporation. Organopolysiloxane-hydrocarbon oil solutions. 4,171,267, Cl. 252-8.600.
McCandless, John H. Internal combustion engines. 4,170,970, Cl. 123-53.0BA.
McCown, Thomas E., to McDonnell Douglas Corporation. Cryogenic insulation system. 4,170,952, Cl. 114-74.00A.

McDonald, David C.: *See*—
Moore, Eugene R.; McDonald, David C.; Willner, Joseph; and Briggs, Roger L., 4,171,453, Cl. 562-406.000.
McDonnell Douglas Corporation: *See*—
McCown, Thomas E., 4,170,952, Cl. 114-74.00A.
McDowell, James E. Apparatus for setting up folded cartons. 4,170,929, Cl. 93-53.0SD.
McNinch, Joseph H., Jr., to Eaton Corporation. Wheel speed sensor. 4,171,495, Cl. 310-155.000.
McQuay-Perfex Inc.: *See*—
Cornelius, Richard T.; and Erickson, Charles G., 4,171,069, Cl. 222-1.000.
MDH Industries, Inc.: *See*—
Marshall, J. Howard, 4,171,485, Cl. 250-359.000.
Mead Corporation, The: *See*—
Sanders, Frederick W., 4,171,350, Cl. 423-580.000.
Meamber, Jon F., to Fast Food Fabricators, Inc. Fast cooking grill. 4,170,933, Cl. 99-349.000.
Meissner, Konrad E., to California Processing Machinery. Fruit positioning apparatus. 4,171,042, Cl. 198-386.000.
Meister, William H.: *See*—
Duke, Billy J.; and Meister, William H., 4,171,185, Cl. 417-12.000.
Melluish, James W. Weight system for glasses. 4,171,153, Cl. 351-158.000.
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., to Bristol-Myers Company. Antibacterial analogs of isocephalosporins. 4,171,439, Cl. 544-105.000.
Merchant, Gould, Smith, Edell, Welter & Schmidt, P.A.: *See*—
Schossow, George W., 4,171,089, Cl. 237-55.000.
Merck & Co., Inc.: *See*—
Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., 4,171,314, Cl. 260-343.410.
Shinkai, Ichiro; Weinstock, Leonard M.; and Tull, Roger J., 4,171,440, Cl. 544-277.000.
Merck Patent Gesellschaft mit beschraenkter Haftung: *See*—
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,171,370, Cl. 424-282.000.
Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., to Eastman Kodak Company. Liquid electrographic developer. 4,171,275, Cl. 252-62.10L.
Meyer, Frank; Kubens, Rolf; and Winkelmann, Martin, to Bergwerksverband GmbH; and Bayer Aktiengesellschaft. Cartridge for securing stay bars in bore holes containing a polyisocyanate component in one compartment and a polyol containing tertiary amine nitrogen in another compartment. 4,171,419, Cl. 528-67.000.
Micetich, Ronald G., to Connlab Holdings Limited. 2-Iodomethylpenams. 4,171,304, Cl. 260-239.100.
Michener, Aubrey W.: *See*—
Bernales, Cicero A.; and Michener, Aubrey W., 4,171,348, Cl. 423-570.000.
Michetti, Louis C.: *See*—
Murray, Lowell C.; Weisheit, Michael L.; and Michetti, Louis C., 4,171,050, Cl. 206-463.000.
Midland-Ross Corporation: *See*—
Zahn, Frederick E.; Checkley, David L.; and Titus, Wallace J., 4,171,126, Cl. 266-250.000.
Mieville, Rodney L., to Standard Oil Company (Indiana). Catalyst for selective hydrocracking of alkylbenzenes. 4,171,290, Cl. 252-466.0PT.
Miki, Masayoshi: *See*—
Hoshino, Taiji; Okubo, Masao; and Miki, Masayoshi, 4,171,218, Cl. 75-128.00C.
Mikulin, Tom T. Universal compass. 4,170,824, Cl. 33-30.00C.
Miles Laboratories, Inc.: *See*—
Biddlecom, William G.; Kluender, Harold C.; and Woessner, Warren D., 4,171,331, Cl. 260-946.000.
Carrico, Robert J.; and Johnson, Richard D., 4,171,432, Cl. 536-26.000.
Milgram, Alvin A., to Owens-Illinois, Inc. Gaseous breakdown display device. 4,171,502, Cl. 313-517.000.
Miller, Arthur F.; Callahan, James L.; and Shaw, Wilfrid G., to Standard Oil Company, The. Oxidation process utilizing amphora catalysts. 4,171,454, Cl. 562-546.000.
Miller, Jerry D., to American Air Filter Company, Inc. Unit filter including filter retaining means. 4,171,210, Cl. 55-481.000.
Miller, Kenneth J.: *See*—
Bucey, Charles W.; Miller, Kenneth J.; and Robinson, Ronald R., 4,171,015, Cl. 165-181.000.
Milliken Research Corporation: *See*—
Carroll, Clifford C., 4,171,404, Cl. 428-413.000.
Varner, George C., 4,170,883, Cl. 68-205.00R.
Mills, Harold E.: *See*—
Hirko, Ronald J.; and Mills, Harold E., 4,171,342, Cl. 423-160.000.
Milo, George T., to Avco Corporation. Lubrication system. 4,170,873, Cl. 60-39.080.
Miloslavsky, Mark I.: *See*—
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, to Hitachi, Ltd.; Sapporo Breweries Ltd.; and Hitachi Denshi Kabushiki Kaisha. Apparatus for inspecting bottles having elliptic light converging means. 4,171,481, Cl. 250-223.00B.
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, to Argus Chemical Corporation. Phenolic ester synthetic resin stabilizers. 4,171,298, Cl. 260-45.85H.
Minck, Klaus: *See*—
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,171,370, Cl. 424-282.000.
Miniere, Jack K., to Geartner, Herbert. Massaging apparatus. 4,170,989, Cl. 128-52.000.
Minnesota Mining and Manufacturing Company: *See*—
Morrow, Charles M., 4,171,397, Cl. 428-195.000.
Wear, Robert L., 4,170,956, Cl. 116-218.000.
Mitchell, Lawrence C.: *See*—
Brackenridge, David R.; and Mitchell, Lawrence C., 4,171,456, Cl. 568-663.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Tanimoto, Tateo; Hiasa, Yukio; Tsukamoto, Hidehiko; Ichikizaki, Tetsuo; Shindo, Akihiro; and Wakayama, Akira, 4,170,889, Cl. 72-85.000.
Miyamoto, Masahiro: *See*—
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.
Miyano, Muneyuki: *See*—
Kurita, Tetsuya; and Miyano, Muneyuki, 4,171,266, Cl. 210-230.000.
Mobil Oil Corporation: *See*—
Farcasiu, Malvina; and Scott, Eric J. Y., 4,171,260, Cl. 208-240.000.
Mobley, Frederick F.: *See*—
Fischell, Robert E.; Fountain, Glen H.; Mobley, Frederick F.; and Sadilek, Albert C., 4,170,904, Cl. 74-5.60E.
Mochizuki, Kazutaka, to Takeda Chemical Industries, Ltd. Blocked isocyanate. 4,171,305, Cl. 260-239.30R.
Molded Products Company: *See*—
Hudson, James N., 4,171,190, Cl. 417-350.000.
Molenaar, Arian; Van Den Bogaert, Henricus M.; and Boven, Jan, to U.S. Philips Corporation. Electroless copper plating solutions. 4,171,225, Cl. 106-1.230.
Monsanto Company: *See*—
D'Amico, John J., 4,171,213, Cl. 71-90.000.
Leonard, Richard L.; and Chernack, Allan D., 4,171,001, Cl. 132-53.000.
Montacie, Marcel, to Bouygues. Continuous boring or cutting machine. 4,171,148, Cl. 299-61.000.
Montedison S.p.A.: *See*—
Bornengo, Mario; Bacciarelli, Sergio; and Serdi, Sergio, 4,171,321, Cl. 260-455.00A.
Moon, Soo-Duck P.: *See*—
Maddox, Lodric L.; and Moon, Soo-Duck P., 4,171,280, Cl. 252-186.000.
Mooney Chemicals, Inc.: *See*—
Collins, Albert V., 4,171,268, Cl. 252-32.70E.
Moore, Eugene R.; McDonald, David C.; Willner, Joseph; and Briggs, Roger L., to Dow Chemical Company, The. Carbonation of alkali metal phenates. 4,171,453, Cl. 562-406.000.
Moore, Frank D., to Norton Company. Tower packing support. 4,171,333, Cl. 261-94.000.
Morehouse Industries, Inc.: *See*—
Trowbridge, Frank R.; Bryan, Walter B.; and Price, Charles R., 4,171,166, Cl. 366-316.000.
Morgan, Kent D. Automobile trunk storage rack. 4,171,078, Cl. 224-42.46R.
Morgan, Laurence G. Security window. 4,170,947, Cl. 109-16.000.
Morgan, Michael J., to Inficon Leybold-Heraeus Inc. Solid state sensor. 4,171,341, Cl. 422-98.000.
Mori, Takanobu: *See*—
Yamaguchi, Kiyoshi; Maki, Naoki; and Mori, Takanobu, 4,171,494, Cl. 310-52.000.
Morinaga and Company, Ltd.: *See*—
Sato, Fumio, 4,171,197, Cl. 425-321.000.
Morisue, Kazushige: *See*—
Tatetsuki, Kuniharu; Hanahara, Tohru; Nakano, Takeshi; and Morisue, Kazushige, 4,171,490, Cl. 250-564.000.
Morris, Herbert C.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Morris, Herbert C.; and Schallenberg, Elmer E., 4,171,270, Cl. 252-42.700.
Morris, Leeson R.: *See*—
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,171,438, Cl. 544-105.000.
Morrison, Albert R.: *See*—
Haynes, Harold L.; and Morrison, Albert R., 4,171,403, Cl. 428-392.000.
Morrison, Howard J.; and Schoenfield, Palmer J., to Marvin Glass & Associates. Self-propelled target tcy. 4,171,133, Cl. 273-127.00C.
Morrow, Charles M., to Minnesota Mining and Manufacturing Company. Sheet material having composite fluorochemical-silicone release coatings. 4,171,397, Cl. 428-195.000.
Morton-Norwich Products, Inc.: *See*—
White, Ralph L., Jr, Ralph L., 4,171,307, Cl. 548-235.000.
Mory, Rudolf, to Ciba-Geigy Corporation. Monoazo pigments containing barbituric acid derivatives. 4,171,301, Cl. 260-154.000.
Moser, Manfred, to Kusters, Eduard. Device for applying designs. 4,170,958, Cl. 118-325.000.

Motegi, Akira; Isowa, Eiji; and Kimura, Kaoru, to Toagosei Chemical Industry Co., Ltd. α-Cyanoacrylate-type adhesive composition. 4,171,416, Cl. 526-245.000.

Motor Wheel Corporation: *See*—
Golata, John H., 4,170,888, Cl. 72-82.000.

Motosugi, Kashuhiko: *See*—
Noguchi, Masaaki; Sekiya, Setsuro; and Motosugi, Kashuhiko, 4,170,968, Cl. 123-32.0SP.

Mrozik, Helmut H.: *See*—
Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., 4,171,314, Cl. 260-343.410.

Mt. Pitt Company, The: *See*—
Collins, Edward H., 4,171,058, Cl. 217-12.00R.

Mueller, Karl F., to Ciba-Geigy Corporation. Fluorinated nonionic surfactants. 4,171,282, Cl. 252-356.000.

Mulaskey, Bernard F., to Chevron Research Company. Sulfur-reactive contact material having improved diffusion characteristics. 4,171,285, Cl. 252-455.00R.

Muller, Dieter J.; and Knepper, Wilhelm, to Chemische Werke Huels Aktiengesellschaft. Preparation of sodium allyl and methallyl sulfonate. 4,171,324, Cl. 260-513.00B.

Muller, Manfred: *See*—
Baumgart, Frank; Bensmann, Gunter; Haasters, Jorg; Hartwig, Jurgen; Jorde, Joachim; Muller, Manfred; and Schlegel, Karl F., 4,170,990, Cl. 128-92.00B.

Munch, Walter: *See*—
Fritz, William L.; and Munch, Walter, 4,170,916, Cl. 84-1.240.

Munk, Edmund E.; and Haas, Herbert G., to Werzalit-Pressholzwerk J.F. Werz Jr. KG. Article molded from fibrous material. 4,171,396, Cl. 428-171.000.

Munro, Neil; Wellstead, Peter E.; Carter, George A.; and Cross, Mark, to British Steel Corporation. Balling process. 4,171,336, Cl. 264-37.000.

Munsch, Charles; and DiMartino, John M., to Line Fast Corporation. Tensible reinforcement bar for shipping containers. 4,171,122, Cl. 254-67.000.

Murray, Lowell C.; Weisheit, Michael L.; and Michetti, Louis C., to Container Corporation of America. Packaging structure. 4,171,050, Cl. 206-463.000.

Murray, Ronald A.; and Wright, Peter D., to TRW Inc. Molding fasteners. 4,170,855, Cl. 52-400.000.

Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Extractive distillation with hydrocarbon solvent of mixture of hydrocarbyl aromatic compound, hydroxy aromatic compound and carbonyl compound. 4,171,245, Cl. 203-68.000.

Musser, John J., to Geo. P. Reintjes Co., Inc. Metal encased refractory brick. 4,170,856, Cl. 52-598.000.

Mutz, Alec N.: *See*—
Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., 4,171,275, Cl. 252-62.10L.

Nagaoka, Tadashi; and Hino, Izumi, to Matsushita Electric Industrial Co., Ltd. Reproducing apparatus for a disk-shaped recording medium. 4,171,136, Cl. 274-23.00A.

Nagashima, Mamoru: *See*—
Onishi, Kimimasa; Ichimatsu, Eiji; Nagashima, Mamoru; Suekane, Junnosuke; and Ogawa, Mikiyoshi, 4,171,008, Cl. 139-339.000.

Nagata, Seiichi; Tanaka, Tsuneo; and Fukai, Masakazu, to Matsushita Electric Industrial Co., Ltd. Method of fabricating three-dimensional epitaxial layers utilizing molecular beams of varied angles. 4,171,234, Cl. 148-175.000.

Nagy, Daniel E.: *See*—
Barua, Girish C.; and Nagy, Daniel E., 4,171,418, Cl. 526-287.000.

Nakagaki, Norio; and Sawada, Shigeru, to Shinshu Seiki Kabushiki Kaisha. Miniaturized printer control assembly. 4,170,937, Cl. 101-99.000.

Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, 4,171,298, Cl. 260-45.85H.

Nakamura, Kazuo: *See*—
Jyojiki, Masao; and Nakamura, Kazuo, 4,171,155, Cl. 354-25.000.

Nakano, Jiro: *See*—
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,170,973, Cl. 123-119.00A.

Nakano, Takeshi: *See*—
Tatetsuki, Kuniharu; Hanahara, Tohru; Nakano, Takeshi; and Morisue, Kazushige, 4,171,490, Cl. 250-564.000.

Nakashima, Toshihide; and Takakura, Koichi, to Kuraray Co., Ltd. Hemoperfusion adsorbents. 4,171,283, Cl. 252-428.000.

Nakazawa, Koji: *See*—
Shono, Hiroaki; Nakazawa, Koji; and Ishikawa, Shinzo, 4,171,212, Cl. 65-11.00R.

Nakazawa, Masahiro: *See*—
Hakata, Yoshihisa; and Nakazawa, Masahiro, 4,170,981, Cl. 126-43.000.

Nakazawa, Tetsuo: *See*—
Hosaka, Nobuyoshi; and Nakazawa, Tetsuo, 4,171,297, Cl. 260-31.20R.

Nalco Chemical Company: *See*—
Connelly, Lawrence J.; and Ballweber, Edward G., 4,171,296, Cl. 260-29.6WQ.

Narita, Hiroshi: *See*—
Horiuchi, Michimasa; Narita, Hiroshi; and Tsuboi, Takashi, 4,171,506, Cl. 318-338.000.

National Research Development Corporation: *See*—
Swinbanks, Malcolm A., 4,171,465, Cl. 179-1.00P.

National Semiconductor: *See*—
Weissberger, Alan J.; and Toal, Ted W., 4,171,537, Cl. 364-704.000.

Naykki, Niilo, to Kopal Oy. Circulating-air oven. 4,171,478, Cl. 219-400.000.

Neal, James G.: *See*—
Lazarus, Stanley D.; Chakravarti, Kalidas; Rowan, Hugh H.; and Neal, James G., 4,171,422, Cl. 528-437.000.

Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek ten Behoeve Van Nijverheid, Handel En Verkeer: *See*—
van der Veek, Augustinus P. M., 4,171,351, Cl. 424-1.000.

Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Correction apparatus for longitudinal or angular measuring system. 4,170,829, Cl. 33-125.00R.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-PGF$_{1\alpha}$ analogs. 4,171,460, Cl. 568-838.000.

Neturen Co. Ltd.: *See*—
Yamada, Kunimitsu, 4,171,176, Cl. 405-257.000.

New Brunswick Scientific Co., Inc.: *See*—
Snyder, Philip; and Freedman, David, 4,170,861, Cl. 53-468.000.

New England Ropes, Inc.: *See*—
Repass, George H., 4,170,921, Cl. 87-6.000.

Newton, Alan F. R.; Haines, Kendrick P.; Harrison, David; and Davidson, John F., to Parel Societe Anonyme. Circulating bed electrodes. 4,171,249, Cl. 204-105.00R.

Nicklas, James R., to Masco Corporation of Indiana. Diverter tub spout. 4,171,005, Cl. 137-119.000.

Nickol, Geoffrey P. Side mover wheel for grain auger. 4,171,040, Cl. 198-302.000.

Nippon Kogaku K.K.: *See*—
Fukuhara, Toru, 4,171,154, Cl. 354-23.00R.

Nippon Oil Co. Ltd.: *See*—
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,171,308, Cl. 260-31.2MR.

Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, to Earth Chemical Company, Ltd. Fumigating apparatus and method. 4,171,340, Cl. 422-36.000.

Nissan Motor Company, Limited: *See*—
Aono, Shigeo, 4,170,965, Cl. 123-32.0EE.
Aoyama, Syunichi, 4,170,972, Cl. 123-119.00A.
Asano, Masaharu, 4,170,969, Cl. 123-32.0EE.
Onishi, Kimimasa; Ichimatsu, Eiji; Nagashima, Mamoru; Suekane, Junnosuke; and Ogawa, Mikiyoshi, 4,171,008, Cl. 139-339.000.

Nitschneider, Robert M.; Sargis, John R.; and Abrams, Martin, to AES Technology Systems, Inc. Staple removing apparatus. 4,171,121, Cl. 254-28.000.

Nitto Boseki Co., Ltd.: *See*—
Shono, Hiroaki; Nakazawa, Koji; and Ishikawa, Shinzo, 4,171,212, Cl. 65-11.00R.

Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., to Compagnie Francaise des Petroles, Societe Anonyme; Etudes Petrolieres Marines, Societe a Responsabilite Limitee; Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme; Compagnie Maritime d'Expertises, Societe Anonyme; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS), Societe Anonyme; and Societe Nationale Elf Aquitaine (Production), Tour Aquitaine. Apparatus for underwater welding of pipes. 4,171,175, Cl. 405-170.000.

Noguchi, Masaaki; Sekiya, Setsuro; and Motosugi, Kashuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary combustion chamber. 4,170,968, Cl. 123-32.0SP.

Nohara, Yasumoto; Harada, Yukio; Toyooka, Morio; and Harada, Takashi, to Hitachi, Ltd. Magazine and a method of storing electronic components. 4,171,049, Cl. 206-328.000.

Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system of an internal combustion engine. 4,170,973, Cl. 123-119.00A.

Nolan, Mary E.; La Conti, Anthony B.; and Dempsey, Russell M., to General Electric Company. Self-humidifying potentiostated, three-electrode hydrated solid polymer electrolyte (SPE) gas sensor. 4,171,253, Cl. 204-195.00S.

Nordeen, Carl W.: *See*—
Winn, Martin; and Nordeen, Carl W., 4,171,367, Cl. 424-273.00P.

Norlin Industries, Inc.: *See*—
Erickson, Norman B., 4,171,475, Cl. 200-241.000.

Norris, Alan H.: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,170,868, Cl. 57-293.000.

Norris Industries, Inc.: *See*—
Marks, Harold C.; and Gillespie, James E., 4,171,149, Cl. 301-37.00P.

Norsk Hydro a.s.: *See*—
Harang, Hakon; Widding, Karl; Andreassen, Knut A.; and Holte, Johan B., 4,171,247, Cl. 204-34.000.

Northern Telecom Limited: *See*—
Lefebvre, Jean P., 4,170,906, Cl. 81-9.510.

Norton Company: *See*—
Moore, Frank D., 4,171,333, Cl. 261-94.000.

O'Brien, Scott T., to Safariland Ballistics, Inc. Inner garment for aiding evaporative cooling. 4,170,793, Cl. 2-113.000.

Occidental Chemical Company: *See*—
Hirko, Ronald J.; and Mills, Harold E., 4,171,342, Cl. 423-160.000.

Occidental Research Corporation: *See*—
Hard, Robert A., 4,171,146, Cl. 299-2.000.

Odenwalder, Heinrich; Puschel, Walter; and Ranz, Erwin, to AGFA-Gevaert, A.G. Light-sensitive color photographic material. 4,171,223, Cl. 96-76.00R.
O'Donnell, Robert J. Child's toy in the form of a miniature storm sewer system. 4,170,839, Cl. 46-17.000.
Officine Savio S.p.A.: *See—*
D'Agnolo, Armando; and Favero, Giovanni, 4,171,105, Cl. 242-18.00R.
Ogawa, Iwakichi, to Takara Co., Ltd. Toy vehicle doll assembly. 4,170,840, Cl. 46-22.000.
Ogawa, Mikiyoshi: *See—*
Onishi, Kimimasa; Ichimatsu, Eiji; Nagashima, Mamoru; Suekane, Junnosuke; and Ogawa, Mikiyoshi, 4,171,008, Cl. 139-339.000.
Ohdan, Kyoji: *See—*
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Hisayuki, Terumi, 4,171,328, Cl. 260-604.00R.
Ohio Agricultural Research and Development Center: *See—*
Smith, Clyde K., 4,171,354, Cl. 424-92.000.
Ohorodnik, Alexander; Kaiser, Karl; and Wesselmann, Rudolf, to Hoechst Aktiengesellschaft. Process for continuously removing monomers from an aqueous dispersion of a polymer. 4,171,427, Cl. 528-500.000.
Okubo, Masao: *See—*
Hoshino, Taiji; Okubo, Masao; and Miki, Masayoshi, 4,171,218, Cl. 75-128.00C.
Okuda, Fukuyasu: *See—*
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,171,340, Cl. 422-36.000.
Okuda, Takahiro: *See—*
Tomita, Kenichi; Uehara, Keiichi; Torii, Kenji; Okuda, Takahiro; Katsura, Hakuji; and Hirano, Isao, 4,171,455, Cl. 568-625.000.
Olasz, Joseph S., to Federal Products Corporation. Bore gage. 4,170,831, Cl. 33-178.00R.
Olsen, Roy W.: *See—*
Badberg, Melvin C.; and Olsen, Roy W., 4,171,118, Cl. 249-183.000.
Olson, Richard M.: *See—*
Chwalek, Vincent P.; and Olson, Richard M., 4,171,383, Cl. 426-623.000.
Chwalek, Vincent P.; and Olson, Richard M., 4,171,384, Cl. 426-623.000.
Olympic Fastening Systems, Inc.: *See—*
Siebol, George, 4,170,919, Cl. 85-71.000.
Siebol, George, 4,170,920, Cl. 85-72.000.
Olympus Optical Co., Ltd.: *See—*
Suzuki, Yoshiro, 4,171,157, Cl. 355-3.0TR.
Tsunefuji, Katsuhiko, 4,171,156, Cl. 354-209.000.
Onishi, Kimimasa; Ichimatsu, Eiji; Nagashima, Mamoru; Suekane, Junnosuke; and Ogawa, Mikiyoshi, to Nissan Motor Company, Limited. Apparatus for detecting malfunction on drawing of catch yarns in a shuttleless loom. 4,171,008, Cl. 139-339.000.
Oosterling, Pieter A.; and Van Zweeden, Adriaan, to Expert N.V. Device for compressing crop into bales. 4,170,934, Cl. 100-100.000.
Operational Devices, Inc.: *See—*
Duke, Billy J.; and Meister, William H., 4,171,185, Cl. 417-12.000.
Oppolzer, Wolfgang: *See—*
Achini, Roland; Oppolzer, Wolfgang; and Pfenninger, Emil, 4,171,369, Cl. 424-274.000.
O'Rear, Dennis J.; and Mayer, Jerome F., to Chevron Research Company. Petroleum distillate upgrading process. 4,171,257, Cl. 208-120.000.
Original Hanau Quarzlampen GmbH: *See—*
Scherzer, Joachim, 4,171,499, Cl. 313-318.000.
Ortiz, Joseph F.: *See—*
Howard, James S.; and Ortiz, Joseph F., 4,171,060, Cl. 220-254.000.
Osborne, Edward T.; and Van Hook, Danny A., to International Business Machines Corporation. Ink jet contamination detecting system. 4,171,527, Cl. 346-75.000.
Osder, Stephen S., to Sperry Rand Corporation. Stability augmentation system for relaxed static stability aircraft. 4,171,115, Cl. 244-181.000.
Osso, John M.: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,171,101, Cl. 241-30.000.
Oswald, Alexis A.: *See—*
Daniher, Francis A.; and Oswald, Alexis A., 4,171,449, Cl. 560-161.000.
Otey, Charles R.; and Winkler, Burton C., Jr., to Sanders Associates, Inc. Secure communications system. 4,171,513, Cl. 325-32.000.
Otsuka Pharmaceutical Factory, Inc.: *See—*
Komatsu, Kyoichi, 4,170,994, Cl. 128-214.00C.
Otsuki, Yutaka: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,171,308, Cl. 260-31.2MR.
Ottofrickenstein, Hans: *See—*
Elser, Wilhelm; Huebner, Klaus; Ottofrickenstein, Hans; and Bossler, Hans, 4,171,407, Cl. 428-500.000.
Owen, Robert E. Hydraulic railroad car door with program plate. 4,170,845, Cl. 49-220.000.
Owens-Corning Fiberglas Corporation: *See—*
Haynes, Harold L.; and Morrison, Albert R., 4,171,403, Cl. 428-392.000.
Owens-Illinois, Inc.: *See—*
Milgram, Alvin A., 4,171,502, Cl. 313-517.000.
Ozaki, Yoshiaki, to Janome Sewing Machine Co., Ltd. Sewing machine with pattern selection indicator. 4,170,950, Cl. 112-158.00F.
Ozawa, Kenneth Y. Rotary sampler for particulate matter. 4,170,900, Cl. 73-424.000.
Pac-Craft Products, Inc.: *See—*
Clark, Albert L., 4,171,120, Cl. 254-1.000.
Packer, Herbert: *See—*
Rosette, King H.; and Packer, Herbert, 4,171,400, Cl. 428-357.000.
Pagava, Gaioz A.: *See—*
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.
Paget, Charles J.; and Sands, John L., to Eli Lilly and Company. N-heterocyclic ureas as immune regulants. 4,171,364, Cl. 424-272.000.
Pallan, William, to British Gas Corporation. Pipeline inspection vehicles. 4,170,902, Cl. 73-432.00R.
Palmcrantz, Jan B.; and Rilbe, Ulf C., to HIAB-FOCO Aktiebolag. Joint between the lower portion and the main portion of a loading crane post and a method of providing such a joint. 4,170,854, Cl. 52-115.000.
Papier- und Kunststoff-Werke Linnich G.m.b.H.: *See—*
Friess, Hans; Kettenbach, Fritz; Farber, Jurgen; Witter, Karl T.; and Strole, Ulrich, 4,171,064, Cl. 220-418.000.
Parel Societe Anonyme: *See—*
Newton, Alan F. R.; Haines, Kendrick P.; Harrison, David; and Davidson, John F., 4,171,249, Cl. 204-105.00R.
Parker, Gordon M., to Wilmington Chemical Corporation. Method of preparing composite sheet material. 4,171,391, Cl. 427-246.000.
Parker, Trevor: *See—*
Caton, Michael P. L.; Parker, Trevor; and Watkins, Gordon L., 4,171,375, Cl. 424-305.000.
Parkitny, Felix, to International Electric Co. Signal light. 4,171,523, Cl. 340-654.000.
Partyka, Richard A.: *See—*
Crenshaw, Ronnie R.; and Partyka, Richard A., 4,171,363, Cl. 424-251.000.
Patchornik, Abraham: *See—*
Haviv, Fortuna; and Patchornik, Abraham, 4,171,434, Cl. 544-27.000.
Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Fromm, Dietrich; Seehawer, Jurgen; Wagner, Wolf-Jurgen; and Winzerling, Erich, 4,171,498, Cl. 313-229.000.
Patil, Ram S.; and Jones, Frederick F., Jr., to Inland Steel Company. Process of hot-dip galvanizing and alloying. 4,171,394, Cl. 427-374.00C.
Patov, Yordan G.: *See—*
Toshev, Vassil S.; Patov, Yordan G.; and Angelova, Emilia I., 4,171,345, Cl. 423-450.000.
Pavey, Donald E.: *See—*
Dillard, Robert D.; and Pavey, Donald E., 4,171,361, Cl. 424-246.000.
Pavlov, Vladimir P.: *See—*
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.
Pawson, Beverly A.: *See—*
Chan, Ka-Kong; and Pawson, Beverly A., 4,171,318, Cl. 260-404.000.
Pearson, Roger W., Sr. Retractable seat cover apparatus for motorcycles. 4,171,145, Cl. 296-78.100.
Pedersen, S. Erik, to Atlantic Richfield Company. Preparation of maleic anhydride using a crystalline vanadium(IV)bis(metaphosphate) catalyst. 4,171,316, Cl. 260-346.750.
Peleg, Alexander. Fastening devices for flexible sheets. 4,170,810, Cl. 24-243.00K.
Peter, Anthony E.; Shott, Frank A.; and Weiss, Robert L., to International Business Machines Corporation. Method of making conductive via holes in printed circuit boards. 4,170,819, Cl. 29-625.000.
Peterson, Gary L.; and Liedtke, Larry L., to United States of America, Navy. Ignitor. 4,170,922, Cl. 89-7.000.
Pettersson, Viktor E., to Arenco Aktiebolag. Method of fixing a fish as to the position thereof in a fish processing machine and a machine for performing said method. 4,170,806, Cl. 17-63.000.
Peveto, John E.; and Cathcart, Gregory D., to Joy Manufacturing Company. Indexing mechanism for an open-head power tong. 4,170,908, Cl. 81-57.110.
Pezzoli, Paul A., to Dow Chemical Company, The. Asbestos treatment with metal molybdates. 4,171,405, Cl. 428-443.000.
Pfenninger, Emil: *See—*
Achini, Roland; Oppolzer, Wolfgang; and Pfenninger, Emil, 4,171,369, Cl. 424-274.000.
Pfundstein, Wolfgang: *See—*
Katz, Klaus; Pfundstein, Wolfgang; and Abt, Reinhold, 4,170,925, Cl. 91-400.000.
Philagro: *See—*
Abblard, Jean; and Baudoin, Michel, 4,171,302, Cl. 260-239.00A.
Phillips, John F.: *See—*
Swisher, George W., Jr.; Smith, Donald W.; and Phillips, John F., 4,171,147, Cl. 299-39.000.
Phillips Petroleum Company: *See—*
Kleiss, Louis D., 4,170,893, Cl. 73-23.100.
Leininger, James C., 4,170,867, Cl. 57-245.000.
Murtha, Timothy P.; and Zuech, Ernest A., 4,171,245, Cl. 203-68.000.

Smith, Ernest L., 4,171,084, Cl. 229-43.000.
Pickering, John F., to Girling Limited. Reservoir assemblies for vehicle braking systems. 4,170,877, Cl. 60-592.000.
Pickles, Joseph, to Ferro Manufacturing Corporation. Tailgate window regulator. 4,170,847, Cl. 49-349.000.
Pike, Herbert J., to J. P. Stevens & Co., Inc. Yarn slubbing device. 4,170,865, Cl. 57-6.000.
Pinnow, Douglas A.; and Gentile, Anthony L., to Hughes Aircraft Company. Medical laser instrument for transmitting infrared laser energy to a selected part of the body. 4,170,997, Cl. 128-395.000.
Pitney-Bowes, Inc.: *See—*
Irvine, Robert; and Luperti, Harry E., 4,171,128, Cl. 271-3.000.
Kish, Richard E.; and Rastorguyeff, Andrew W., 4,171,127, Cl. 270-58.000.
Plaat, Cornelius L., to B. F. Goodrich Company, The. Brake retractor mechanism. 4,171,036, Cl. 188-196.00R.
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F. Contact plate for mass-exchange columns. 4,171,335, Cl. 261-155.000.
Platz, Rolf: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; Platz, Rolf; Magnussen, Peter; and Weiss, Franz-Josef, 4,171,451, Cl. 560-204.000.
Pless, Otto C., Jr.: *See—*
Faust, Paul J.; and Pless, Otto C., Jr., 4,171,343, Cl. 423-359.000.
Polysciences, Inc.: *See—*
Wolgemuth, Richard L.; Hanson, Kenneth M.; and Zassenhaus, Peter H., 4,171,352, Cl. 424-9.000.
Popp, Vasile V.: *See—*
Cucuiat, Iulius M.; and Popp, Vasile V., 4,171,349, Cl. 423-574.00L.
Porter, William D.: *See—*
Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., 4,171,402, Cl. 428-369.000.
Portionmat (Engineering) Limited: *See—*
Faulkner, Keith; and Appleford, David E., 4,171,067, Cl. 222-1.000.
Potomac Applied Mechanics, Inc.: *See—*
Stubbings, James H., 4,170,910, Cl. 83-71.000.
Pounder, Edwin J.; and Casani, John R., to Signet Scientific Company. Detachable automatic pilot for wheel-steered boats. 4,170,953, Cl. 114-144.00E.
Powell, J. Anthony, to Real Time Systems, Inc. Electronic angular position encoder apparatus. 4,171,522, Cl. 340-347.00P.
PPG Industries, Inc.: *See—*
Carlin, William W., 4,171,248, Cl. 204-89.000.
Hartman, Marvis E.; Dowbenko, Rostyslaw; and Hockswender, Thomas R., 4,171,413, Cl. 525-329.000.
PQ Corporation: *See—*
Derolf, M. Robert; and Katsanis, Eleftherios P., 4,171,227, Cl. 106-85.000.
Precoul, Michel, to Societe d'Etudes, de Realisations et d'Applications Techniques. Projectile charges. 4,170,940, Cl. 102-56.0SC.
Price, Charles R.: *See—*
Trowbridge, Frank R.; Bryan, Walter B.; and Price, Charles R., 4,171,166, Cl. 366-316.000.
Prillieux, Marcel: *See—*
Marin, Pierre D.; Prillieux, Marcel; and Tirtiaux, Robert, 4,171,323, Cl. 260-501.190.
Prochaska, John J. Manually adjustable picture hanger. 4,171,117, Cl. 248-495.000.
Puschel, Walter: *See—*
Odenwalder, Heinrich; Puschel, Walter; and Ranz, Erwin, 4,171,223, Cl. 96-76.00R.
Vetter, Hans; Puschel, Walter; and Marx, Paul, 4,171,220, Cl. 96-29.00D.
Quinn, Cassandrasu D.; and Vachon, Marcel O. Calligraphic alphabet lettering kit. 4,170,833, Cl. 35-36.000.
R. O. Hull & Company, Inc.: *See—*
Bishop, Craig V.; Foley, Thomas J.; and Frank, James M., 4,171,231, Cl. 148-6.210.
Raceway Components, Inc.: *See—*
Kohaut, John E., 4,170,853, Cl. 52-99.000.
Radzins, Edmund A.: *See—*
Hirsch, John L.; and Radzins, Edmund A., 4,171,239, Cl. 156-461.000.
Ragsdale, Clyde: *See—*
Ragsdale, Robert L., 4,171,092, Cl. 239-70.000.
Ragsdale, Robert L., to Ragsdale, Clyde, a part interest. Fumigation system. 4,171,092, Cl. 239-70.000.
Rahlfs, Herbert K., to Reifenhauser KG. Apparatus for the production of shaped strands of thermoplastic synthetic-resin material. 4,171,193, Cl. 425-71.000.
Rakhimkulov, Mirsaid M.: *See—*
Kunitsyn, Valery A.; and Rakhimkulov, Mirsaid M., 4,171,104, Cl. 241-160.000.
Ralston Purina Company: *See—*
Harmon, Bud G.; Skoch, Leroy V.; and Dickerson, Charles W., 4,171,379, Cl. 426-2.000.
Skoch, Leroy V.; and Hodge, Dean E., 4,171,385, Cl. 426-658.000.
Skoch, Leroy V.; Harmon, Bud G.; and Dickerson, Charles W., 4,171,386, Cl. 426-658.000.
Ramey, Robert A.: *See—*
Colgate, Samuel O.; and Ramey, Robert A., 4,171,070, Cl. 222-133.000.
Ranz, Erwin: *See—*
Odenwalder, Heinrich; Puschel, Walter; and Ranz, Erwin, 4,171,223, Cl. 96-76.00R.
Rastorguyeff, Andrew W.: *See—*
Kish, Richard E.; and Rastorguyeff, Andrew W., 4,171,127, Cl. 270-58.000.
Ratelband, Johannes B. Swimming apparatus. 4,170,799, Cl. 4-172.000.
Rath, Harlan J.: *See—*
Knowles, Alfred E., 4,170,808, Cl. 24-163.00K.
Rauf, Richard: *See—*
Kayser, Franz; Rauf, Richard; Schmitz, Wimmar; and Schlunke, Jurgen, 4,171,107, Cl. 242-67.10R.
Rayno, Glenn D., to Advance Transformer Co. Method of making a dual value capacitor. 4,170,812, Cl. 29-25.420.
Raytheon Company: *See—*
Faxon, Merle W., 4,171,514, Cl. 325-121.000.
RCA Corporation: *See—*
Turnbull, John C., 4,170,811, Cl. 29-25.160.
Real Time Systems, Inc.: *See—*
Powell, J. Anthony, 4,171,522, Cl. 340-347.00P.
Rebold, Jerome I., to CBS Inc. Airbrush. 4,171,097, Cl. 239-341.000.
Reck, Ray G. Golf game. 4,171,134, Cl. 273-181.00R.
Reed, Thomas C., to Walker-Neer Manufacturing Co., Inc. Air injection sub. 4,171,187, Cl. 417-170.000.
Rehabilitation Institute of Chicago: *See—*
Wu, Yeongchi, 4,170,996, Cl. 128-349.00R.
Reichard, Michel; and Krassoulia, Georges, to Societe Europeenne de Propulsion. Igniter for a block of propellant powder. 4,170,941, Cl. 102-202.000.
Reichman, Uri: *See—*
Watanabe, Kyoichi A.; Hirota, Kosaku; Chu, Chung K.; Reichman, Uri; and Fox, Jack J., 4,171,429, Cl. 536-1.000.
Reifenhauser KG: *See—*
Rahlfs, Herbert K., 4,171,193, Cl. 425-71.000.
Reilly, John E.: *See—*
Steele, Richard S., 4,170,844, Cl. 47-62.000.
Reilly, Terrence H.: *See—*
Anselmo, Victor J.; and Reilly, Terrence H., 4,170,987, Cl. 128-665.000.
Reinebar AG: *See—*
Baram, Martin, 4,170,814, Cl. 29-452.000.
Reiner, Robert, to Siemens Aktiengesellschaft. Method and apparatus for remote control. 4,171,468, Cl. 179-15.0AW.
Reitberger, Rudolf: *See—*
Lippacher, Wolfgang; Teger, Gerhard; and Reitberger, Rudolf, 4,171,083, Cl. 227-69.000.
Reiter, Paul, to Balcke-Durr Aktiengesellschaft. Apparatus for securing assembly plates in spraying installations of heat exchangers. 4,171,334, Cl. 261-112.000.
Repass, George H., to New England Ropes, Inc. Braided rope. 4,170,921, Cl. 87-6.000.
Research Corporation: *See—*
Watanabe, Kyoichi A.; Hirota, Kosaku; Chu, Chung K.; Reichman, Uri; and Fox, Jack J., 4,171,429, Cl. 536-1.000.
Resofszki, Gabor: *See—*
Huhn, Magda; Szabo, Gabor; Resofszki, Gabor; and Somfai, Eva, 4,171,303, Cl. 260-239.100.
Reuter, Franz G.: *See—*
Hilterhaus, Karl; Reuter, Franz G.; and Reuter Technologie GmbH, 4,171,390, Cl. 427-244.000.
Reuter Technologie GmbH: *See—*
Hilterhaus, Karl; Reuter, Franz G.; and Reuter Technologie GmbH, 4,171,390, Cl. 427-244.000.
Reyes, Apolonio: *See—*
Jimenez, James A.; Aguirre, Alfred A.; and Reyes, Apolonio, 4,171,198, Cl. 425-377.000.
Reynolds Metals Company: *See—*
Lazure, Frank S., 4,170,862, Cl. 53-471.000.
Richard, J. Berchman, Jr. Bicycle carriers for buses and the like. 4,171,077, Cl. 224-42.03B.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Tuba, Zoltan; and Marsai, Maria, 4,171,306, Cl. 260-239.55R.
Riedel, Tilo, to S.A. Etablissements Francois Salomon & Fils. Ski brake. 4,171,138, Cl. 280-605.000.
Rieger, Walter, to Bauhutte Leitl-Werke Rieger-Anlagentechnik GmbH. Facade construction. 4,170,857, Cl. 52-513.000.
Rieter Machine Works, Ltd.: *See—*
Fluck, Jakob; and Schenkel, Eduard, 4,171,201, Cl. 432-59.000.
Lattmann, Werner; and Wildbolz, Rudolf, 4,171,262, Cl. 209-555.000.
Rieth, Kurt A.: *See—*
Vanover, Wallace F.; and Rieth, Kurt A., 4,170,871, Cl. 59-82.000.
Vanover, Wallace F.; and Rieth, Kurt A., 4,170,872, Cl. 59-82.000.
Rilbe, Ulf C.: *See—*
Palmcrantz, Jan B.; and Rilbe, Ulf C., 4,170,854, Cl. 52-115.000.
Rinaldi, Victor. Semi-submersible vessel. 4,170,954, Cl. 114-265.000.
Risser, Roger L.: *See—*
Wagstaff, Robert A.; Jenny, Bernard T.; and Risser, Roger L., 4,171,180, Cl. 414-502.000.
Ritter, Ernst: *See—*
Eckert, Konrad; Maier, Sieghart; and Ritter, Ernst, 4,170,976, Cl. 123-140.0FG.
Robert Bosch GmbH: *See—*
Eckert, Konrad; Maier, Sieghart; and Ritter, Ernst, 4,170,976, Cl. 123-140.0FG.
Jung, Rainer, 4,171,161, Cl. 356-383.000.

Kopse, Odon; and Kuschmierz, Heinz, 4,170,974, Cl. 123-139.0AT.
Kopse, Odon; Kinzel, Richard; Eblen, Ewald; Voit, Willi; Schuster, Gregor; and Eheim, Franz, 4,171,099, Cl. 239-533.800.
Landau, Gunter, 4,171,530, Cl. 360-70.000.
Latsch, Reinhard, 4,170,979, Cl. 123-32.0SP.
Wessel, Wolf; and Stumpp, Gerhard, 4,170,967, Cl. 123-32.0EE.
Wessel, Wolf; Grieshaber, Hermann; and Holzbaur, Siegfried, 4,170,975, Cl. 123-139.0AW.

Roberts, Thomas E., Jr.; Wright, Bruce M.; Watson, Clyde D.; and Abbott, John A., to FMC Corporation. Pressurized oxygenation of sewage. 4,171,263, Cl. 210-8.000.

Robinson, Ronald R.: *See*—
Bucey, Charles W.; Miller, Kenneth J.; and Robinson, Ronald R., 4,171,015, Cl. 165-181.000.

Robinson, Roy D.: *See*—
Flinn, Robert W.; and Robinson, Roy D., 4,170,860, Cl. 53-170.000.

Rockwell International Corporation: *See*—
Sheller, Daniel R., 4,171,538, Cl. 364-900.000.
Strathman, Lyle R., 4,171,504, Cl. 315-378.000.

Rodriguez, Roberto. Hot-tray manipulating device. 4,171,144, Cl. 294-30.000.

Roe, Alfred W., to Roe International, Inc. Tape measure casing. 4,171,109, Cl. 242-107.000.

Roe International, Inc.: *See*—
Roe, Alfred W., 4,171,109, Cl. 242-107.000.

Roeben, Hermann: *See*—
Frese, Albert; Roeben, Hermann; and Denzel, Horst, 4,171,295, Cl. 260-23.00H.

Rogatkin, Alexandr A.: *See*—
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.

Rogers, John W. Steel metal web handling method. 4,171,080, Cl. 225-2.000.

Rogl, Herbert A.: *See*—
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,171,101, Cl. 241-30.000.

Rohm GmbH: *See*—
Elser, Wilhelm; Huebner, Klaus; Ottofrickenstein, Hans; and Bossler, Hans, 4,171,407, Cl. 428-500.000.

Rohm, Robert F.; and Bushman, Ronald C., to Brown International Corporation. Fruit juice extraction apparatus. 4,170,935, Cl. 100-121.000.

Rohrbach, Carl: *See*—
Cornell, Robert W.; and Rohrbach, Carl, 4,171,183, Cl. 416-94.000.

Rolls-Royce Limited: *See*—
Harvey, Harry M., 4,171,112, Cl. 244-12.500.
Lings, Barry W.; and Gale, Anthony G., 4,171,184, Cl. 416-97.00R.

Roraff, Francis J.: *See*—
Jehn, Thomas C.; Roraff, Francis J.; and Bauers, Gerald T., 4,170,964, Cl. 122-235.00G.

Rose, David; Weinrich, Erwin; and Lieske, Edgar, to Henkel Kommanditgesellschaft auf Aktien. Hair dye compositions 3,5-diamino-2-substituted-alkylbenzenes. 4,171,203, Cl. 8-10.200.

Rosen, Meyer R.; Braun, David B.; and Drap, Stephen, to Union Carbide Corporation. Process for forming ceramic bodies employing aqueous lubricant. 4,171,337, Cl. 264-56.000.

Rosenberg, Alexander J.; and Rosenberg, Philip M. Veterinary examination table. 4,170,961, Cl. 119-103.000.

Rosenberg, Philip M.: *See*—
Rosenberg, Alexander J.; and Rosenberg, Philip M., 4,170,961, Cl. 119-103.000.

Rosenthal Technik AG: *See*—
Zeibig, Anton; and Scales, John T., 4,170,794, Cl. 3-1.910.

Rosette, King H.; and Packer, Herbert, to Harshaw Chemical Company, The. Shaped press-forged normally frangible inorganic crystals. 4,171,400, Cl. 428-357.000.

Rossio, John H., to LaRos Equipment Company, Inc. Inclined belt conveyor. 4,171,044, Cl. 198-834.000.

Rossler, Kurt, to Max Frost, Maschinen- und Apparatebau. Apparatus for comminuting waste materials. 4,171,103, Cl. 241-152.00A.

Rowan, Hugh H.: *See*—
Lazarus, Stanley D.; Chakravarti, Kalidas; Rowan, Hugh H.; and Neal, James G., 4,171,422, Cl. 528-437.000.

Roy, Norman A. Method of manufacturing footwear. 4,170,802, Cl. 12-142.0RS.

Rozsa, Kalman, to Datasaab Aktiebolag. Method and device for the reading of data. 4,171,479, Cl. 235-449.000.

Rubin, Isaac D.: *See*—
Waldbillig, James O.; and Rubin, Isaac D., 4,171,273, Cl. 252-51.50A.

Rubin, Mendek: *See*—
Geldwerth, Simon; and Rubin, Mendek, 4,170,809, Cl. 24-230.00R.

Ruhl, Hermann. Acceleration warning device. 4,171,030, Cl. 180-179.000.

Rupilius, Wolfgang: *See*—
Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, 4,171,278, Cl. 252-102.000.

Rupprath, Hans F.: *See*—
Schiron, Klaus; and Rupprath, Hans F., 4,170,796, Cl. 4-172.000.

Russell, Dudley W. Scaling parallel bar. 4,170,825, Cl. 33-444.000.

Rust, Willard J.; and Rust, Willard M. Scaffold device. 4,171,033, Cl. 182-63.000.

Rust, Willard M.: *See*—
Rust, Willard J.; and Rust, Willard M., 4,171,033, Cl. 182-63.000.

Rustul, Pierre: *See*—
Legrix, Georges; Junca, Gerard; Bouron, Michel; and Rustul, Pierre, 4,171,401, Cl. 428-369.000.

Rutzen, Horst: *See*—
Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, 4,171,278, Cl. 252-102.000.

Ryan, Charles W., to Eli Lilly and Company. Preparation of cis-hexahydrodibenzopyranones. 4,171,315, Cl. 260-345.300.

Ryan, Wayne L. Immunization of animals using choline esters as an immunological adjuvant. 4,171,353, Cl. 424-88.000.

Sadilek, Albert C.: *See*—
Fischell, Robert E.; Fountain, Glen H.; Mobley, Frederick F.; and Sadilek, Albert C., 4,170,904, Cl. 74-5.60E.

Sadler, Charlton. Solar heater. 4,170,983, Cl. 126-450.000.

Sadler, Thomas H.; and Dalton, John J., to Johns-Manville Corporation. Method of making reinforced plastic composite structure. 4,171,238, Cl. 156-173.000.

Safariland Ballistics, Inc.: *See*—
O'Brien, Scott T., 4,170,793, Cl. 2-113.000.

Saint-Gobain Industries: *See*—
Battigelli, Jean A.; and Barthe, Marie-Pierre, 4,171,265, Cl. 210-56.000.

Saito, Gunsei, to Hukuba Kogyo Kabushiki Kaisha. Floor sweeper having a pivotable handle. 4,170,803, Cl. 15-144.00R.

Sakai, Yoshio: *See*—
Shima, Seiya; Kuroha, Hiroaki; Takeki, Ando; Inaba, Hiromi; Kurosawa, Toshiaki; Terunuma, Mutsuhiro; and Sakai, Yoshio, 4,171,505, Cl. 318-316.000.

Sakulevich, Faddei J.; and Kosobutsky, Alexandr A. Rotary machine for three-dimensional polishing of workpieces shaped as solids of revolution in a magnetic field using ferromagnetic abrasive powders. 4,170,849, Cl. 51-7.000.

Salamon, Karlene W., to G. D. Searle & Co. Alkyl 7-[tetrahydro-4-(3-hydroxy-1-octenyl)-2,6-dioxo-4H-cyclopenta-1,3-dioxol-5-yl]-5-heptenoates. 4,171,312, Cl. 260-340.200.

Salter, Stephen H. Apparatus for creating surface waves in a body of liquid. 4,170,898, Cl. 73-148.000.

Samuel Colgate, Robert Ramey and Associates: *See*—
Colgate, Samuel O.; and Ramey, Robert A., 4,171,070, Cl. 222-133.000.

Sanders Associates, Inc.: *See*—
Otey, Charles R.; and Winkler, Burton C., Jr., 4,171,513, Cl. 325-32.000.

Sanders, Frederick W., to Mead Corporation, The. Method for reacting hydrogen and oxygen in the presence of a liquid phase. 4,171,350, Cl. 423-580.000.

Sandoz, Inc.: *See*—
Smith, Joseph A., 4,171,441, Cl. 544-286.000.

Sandoz Ltd.: *See*—
Achini, Roland; Oppolzer, Wolfgang; and Pfenninger, Emil, 4,171,369, Cl. 424-274.000.

Sands, John L.: *See*—
Paget, Charles J.; and Sands, John L., 4,171,364, Cl. 424-272.000.

Sapporo Breweries Ltd.: *See*—
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.

Sargis, John R.: *See*—
Nitschneider, Robert M.; Sargis, John R.; and Abrams, Martin, 4,171,121, Cl. 254-28.000.

Sasin, Arkady G.: *See*—
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.

Sato, Fumio, to Morinaga and Company, Ltd. Apparatus for continuously rolling up sheets of baked cookies. 4,171,197, Cl. 425-321.000.

Sato, Masao, to Amada Company, Limited. Feed control for horizontal bandsaw machines. 4,170,915, Cl. 83-800.000.

Sato, Nobuo: *See*—
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Printing head for label printing machine. 4,170,938, Cl. 101-111.000.

Sauder, James W., to Chattanooga Pharmacal Company. Portable cooling apparatus. 4,170,998, Cl. 128-400.000.

Sawada, Shigeru: *See*—
Nakagaki, Norio; and Sawada, Shigeru, 4,170,937, Cl. 101-99.000.

Scales, John T.: *See*—
Zeibig, Anton; and Scales, John T., 4,170,794, Cl. 3-1.910.

Scan-Optics, Inc.: *See*—
Daley, William C.; Hall, Andrew; and Sikes, Arthur M., 4,171,129, Cl. 271-6.000.

Schallenberg, Elmer E.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Morris, Herbert C.; and Schallenberg, Elmer E., 4,171,270, Cl. 252-42.700.

Scheffee, Robert S., to Atlantic Research Corporation. Solar energy heat collector. 4,170,984, Cl. 126-432.000.

Schenkel, Eduard: *See—*
Fluck, Jakob; and Schenkel, Eduard, 4,171,201, Cl. 432-59.000.
Schering Corporation: *See—*
Wright, John J.; and Mallams, Alan K., 4,171,356, Cl. 424-180.000.
Scherzer, Joachim, to Original Hanau Quarzlampen GmbH. Electric lamp and socket construction, particularly infrared, elongated, high-power radiator for photo copy apparatus, and method of its manufacture. 4,171,499, Cl. 313-318.000.
Schiron, Dieter: *See—*
Heller, Karl H.; and Schiron, Dieter, 4,171,059, Cl. 220-4.00F.
Schiron, Klaus; and Rupprath, Hans F. Swimming pool with protective wall. 4,170,796, Cl. 4-172.000.
Schlegel, Karl F.: *See—*
Baumgart, Frank; Bensmann, Gunter; Haasters, Jorg; Hartwig, Jurgen; Jorde, Joachim; Muller, Manfred; and Schlegel, Karl F., 4,170,990, Cl. 128-92.00B.
Schlegl, Eugen: *See—*
Seit, Horst; and Schlegl, Eugen, 4,171,027, Cl. 180-9.540.
Schliep, Hans-Jochen: *See—*
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,171,370, Cl. 424-282.000.
Schloss, Phillip C.: *See—*
Heuer, Dale A.; Schloss, Phillip C.; and Schroeder, Larry L., 4,171,536, Cl. 364-200.000.
Schlunke, Jurgen: *See—*
Kayser, Franz; Rauf, Richard; Schmitz, Wimmar; and Schlunke, Jurgen, 4,171,107, Cl. 242-67.10R.
Schmidt, Karl-Walter, to Daimler-Benz AG. Mixture-compressing internal combustion engine, especially four-cycle engine. 4,170,966, Cl. 123-32.0SA.
Schmitz, Wimmar: *See—*
Kayser, Franz; Rauf, Richard; Schmitz, Wimmar; and Schlunke, Jurgen, 4,171,107, Cl. 242-67.10R.
Schneider, Heinz-Walter: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; Platz, Rolf; Magnussen, Peter; and Weiss, Franz-Josef, 4,171,451, Cl. 560-204.000.
Schoenfield, Palmer J.: *See—*
Morrison, Howard J.; and Schoenfield, Palmer J., 4,171,133, Cl. 273-127.00C.
Schossow, George W., to Schossow, George W.; and Merchant, Gould, Smith, Edell, Welter & Schmidt, P.A. Heat exchanger. 4,171,089, Cl. 237-55.000.
Schrader, Paul D., to General Electric Company. Low voltage protection circuit for induction motors. 4,171,533, Cl. 361-22.000.
Schreiber, Gus. Lift-force pump activated by the weight and buoyancy of giant buoys. 4,171,189, Cl. 417-332.000.
Schreyer, Gerd: *See—*
Beschke, Helmut; Friedrich, Heinz; and Schreyer, Gerd, 4,171,445, Cl. 546-251.000.
Schroeder, Larry L.: *See—*
Heuer, Dale A.; Schloss, Phillip C.; and Schroeder, Larry L., 4,171,536, Cl. 364-200.000.
Schumann, Horst: *See—*
Finster, Theodor; Fricke, Hans-Dieter; and Schumann, Horst, 4,171,232, Cl. 148-24.000.
Schuster, Gregor: *See—*
Kopse, Odon; Kinzel, Richard; Eblen, Ewald; Voit, Willi; Schuster, Gregor; and Eheim, Franz, 4,171,099, Cl. 239-533.800.
Schuster, Ludwig; Hickmann, Eckhard; and Halbritter, Klaus, to BASF Aktiengesellschaft. Manufacture of α-naphthol. 4,171,458, Cl. 568-735.000.
Schuster, Ludwig; and Seid, Bernhard, to BASF Aktiengesellschaft. Manufacture of α-naphthol. 4,171,459, Cl. 568-735.000.
Schuur, Patrick D.: *See—*
Asphahani, Aziz I.; Hodge, F. Galen; Leonard, Robert B.; and Schuur, Patrick D., 4,171,217, Cl. 75-122.000.
Schwanz, Hugo, to Sig Schweizerische Industriegesellschaft. Apparatus for the continuous production of packages. 4,170,863, Cl. 53-511.000.
Schwarz, William M.; Karz, Robert S.; Erhardt, Peter F.; and Dickerson, Charles G., to Xerox Corporation. Alteration of tesselated magnetic particles by fracture. 4,171,274, Cl. 252-62.10P.
Schwenzer, Kathryn S.; and Magic, Susan E., to Abbott Laboratories. Precipitation of protein. 4,171,204, Cl. 23-230.00B.
Scientific Process & Research, Inc.: *See—*
Klein, Reuben; Klein, Imrich; and Cidon, Yigal, 4,171,195, Cl. 425-141.000.
Scotcher, Douglas E., to Vanauto Accessories Proprietary Limited. Wiper arm and mounting head. 4,170,804, Cl. 15-250.340.
Scott, Eric J. Y.: *See—*
Farcasiu, Malvina; and Scott, Eric J. Y., 4,171,260, Cl. 208-240.000.
Seehawer, Jurgen: *See—*
Fromm, Dietrich; Seehawer, Jurgen; Wagner, Wolf-Jurgen; and Winzerling, Erich, 4,171,498, Cl. 313-229.000.
Seeley, Elwin W., to United States of America, Navy. VLF loop array antenna. 4,171,525, Cl. 343-853.000.
Segatto, Peter R.: *See—*
Allen, Richard E.; and Segatto, Peter R., 4,171,388, Cl. 427-129.000.
Allen, Richard E.; and Segatto, Peter R., 4,171,399, Cl. 428-336.000.
Seid, Bernhard: *See—*
Schuster, Ludwig; and Seid, Bernhard, 4,171,459, Cl. 568-735.000.
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., to Black Clawson Company, The. Method of operating a disk refiner provided with reversible refining plates. 4,171,101, Cl. 241-30.000.
Seit, Horst; and Schlegl, Eugen, to Krauss-Maffei Aktiengesellschaft. Mounting system for the terminal drive of a tracked vehicle. 4,171,027, Cl. 180-9.540.
Seki, Nagataka: *See—*
Higa, Osamu; and Seki, Nagataka, 4,171,517, Cl. 328-72.000.
Sekiya, Setsuro: *See—*
Noguchi, Masaaki; Sekiya, Setsuro; and Motosugi, Kashuhiko, 4,170,968, Cl. 123-32.0SP.
Senderov, Evgeny N.: *See—*
Zhukov, Evgeny I.; Kichulkin, Viktor A.; Tsernes, Vladimir Y.; Shekhel, Alexandr B.; Kershenbaum, Naum Y.; Senderov, Evgeny N.; and Ivoilov, Oleg G., 4,170,944, Cl. 104-138.00R.
Senterfitt, Donald R.: *See—*
Honeycutt, Fred L., Jr.; and Senterfitt, Donald R., 4,171,093, Cl. 239-127.300.
Serdi, Sergio: *See—*
Bornengo, Mario; Bacciarelli, Sergio; and Serdi, Sergio, 4,171,321, Cl. 260-455.00A.
Seufert, Ludwig. Picture frame mat. 4,170,836, Cl. 40-158.00R.
Severus-Laubenfeld, Harald: *See—*
Bolliger, Max; and Severus-Laubenfeld, Harald, 4,171,230, Cl. 148-6.100.
SHA, Torshallaverken: *See—*
Beyerl, Robert; and Beyerl, Richard, 4,170,864, Cl. 57-3.000.
Shandon Southern Products Limited: *See—*
Henderson, Kenneth J.; and Gordon, Alan J., 4,171,241, Cl. 156-556.000.
Shaw, Wilfrid G.: *See—*
Miller, Arthur F.; Callahan, James L.; and Shaw, Wilfrid G., 4,171,454, Cl. 562-546.000.
Shekhel, Alexandr B.: *See—*
Zhukov, Evgeny I.; Kichulkin, Viktor A.; Tsernes, Vladimir Y.; Shekhel, Alexandr B.; Kershenbaum, Naum Y.; Senderov, Evgeny N.; and Ivoilov, Oleg G., 4,170,944, Cl. 104-138.00R.
Shell Oil Company: *See—*
Benson, Arnold M.; Heath, James E.; and Matovich, Mark A., 4,171,264, Cl. 210-40.000.
Sheller, Daniel R., to Rockwell International Corporation. Elastic store slip circuit apparatus for preventing read and write operations interference. 4,171,538, Cl. 364-900.000.
Shephard, Margaret C.: *See—*
Balasubramanyan, Sugavanam; and Shephard, Margaret C., 4,171,214, Cl. 71-92.000.
Sheppee Engineering Limited: *See—*
Doyle, John P., 4,171,043, Cl. 198-430.000.
Shima, Seiya; Kuroha, Hiroaki; Takeki, Ando; Inaba, Hiromi; Kurosawa, Toshiaki; Terunuma, Mutsuhiro; and Sakai, Yoshio, to Hitachi, Ltd. Fault detecting system for a control system. 4,171,505, Cl. 318-316.000.
Shimano Industrial Company Limited: *See—*
Ishida, Takuo; and Ban, Masuo, 4,171,108, Cl. 242-84.20G.
Shimizu, Masami: *See—*
Aizu, Shoichi; and Shimizu, Masami, 4,171,137, Cl. 277-25.000.
Shimrock, Thomas: *See—*
Keith, Carl D.; Larsen, William R.; and Shimrock, Thomas, 4,171,288, Cl. 252-462.000.
Shindo, Akihiro: *See—*
Tanimoto, Tateo; Hiasa, Yukio; Tsukamoto, Hidehiko; Ichikizaki, Tetsuo; Shindo, Akihiro; and Wakayama, Akira, 4,170,889, Cl. 72-85.000.
Shinkai, Ichiro; Weinstock, Leonard M.; and Tull, Roger J., to Merck & Co., Inc. Process for purification of 9-(2,6-dihalobenzyl)adenines. 4,171,440, Cl. 544-277.000.
Shinoda, Arihiro, to Stanley Electric Co., Ltd. Sealed beam lamp for automobile. 4,171,497, Cl. 313-113.000.
Shinshu Seiki Kabushiki Kaisha: *See—*
Nakagaki, Norio; and Sawada, Shigeru, 4,170,937, Cl. 101-99.000.
Shirek, Lawrence J.: *See—*
Taylor, David H.; Grant, Hendrie J.; and Shirek, Lawrence J., 4,171,192, Cl. 418-32.000.
Shiseido Company Ltd.: *See—*
Tomita, Kenichi; Uehara, Keiichi; Torii, Kenji; Okuda, Takahiro; Katsura, Hakuji; and Hirano, Isao, 4,171,455, Cl. 568-625.000.
Shono, Hiroaki; Nakazawa, Koji; and Ishikawa, Shinzo, to Nitto Boseki Co., Ltd. Molten glass separating device in glass fiber forming apparatus. 4,171,212, Cl. 65-11.00R.
Shott, Frank A.: *See—*
Peter, Anthony E.; Shott, Frank A.; and Weiss, Robert L., 4,170,819, Cl. 29-625.000.
Sideman, Carl E.; and Lewis, Thomas E., to Litton Business Systems, Inc. Sheet containing sublimable dye and blocking reagent for heat transfer printing. 4,171,202, Cl. 8-2.50A.
Siebol, George, to Olympic Fastening Systems, Inc. Blind spacer fastener. 4,170,919, Cl. 85-71.000.
Siebol, George, to Olympic Fastening Systems, Inc. Blind spacer fastener. 4,170,920, Cl. 85-72.000.
Siegrist, Eugen J. Boilers. 4,170,963, Cl. 122-33.000.
Siemens AG: *See—*
Finkenzeller, Johann; and Derfuss, Jakob, 4,171,483, Cl. 250-321.000.
Siemens Aktiengeselleschaft: *See—*
Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenther; and Greiner, Hans-Joachim, 4,171,487, Cl. 250-408.000.

Siemens Aktiengesellschaft: *See—*
Kuehnel, Werner, 4,171,488, Cl. 250-421.000.
Reiner, Robert, 4,171,468, Cl. 179-15.0AW.

Sievert, William C.; Cundiff, James B.; Klobuchar, Peter A.; Lindberg, Larry H.; and Kargol, James A., to Inland Steel Company. Process of producing one-side alloyed galvanized steel strip. 4,171,392, Cl. 427-321.000.

Sig Schweizerische Industriegesellschaft: *See—*
Schwanz, Hugo, 4,170,863, Cl. 53-511.000.

Signet Scientific Company: *See—*
Pounder, Edwin J.; and Casani, John R., 4,170,953, Cl. 114-144.00E.

Signetics Corporation: *See—*
Stephens, Mark L.; and Gray, Paul R., 4,171,509, Cl. 323-75.00C.

Sikes, Arthur M.: *See—*
Daley, William C.; Hall, Andrew; and Sikes, Arthur M., 4,171,129, Cl. 271-6.000.

Silakov, Grigory I.: *See—*
Galkin, Pavel N.; Komarov, Boris V.; Khlopkov, Leonid P.; Gorbatenko, Eduard V.; Luttsev, Boleslav D.; Kiprich, Nikolai A.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Galitsky, Nikolai V.; Sasin, Arkady G.; Miloslavsky, Mark I.; Gashenko, Stanislav I.; Lekalova, Lidia I.; and Bystrenin, Mikhail N., 4,171,281, Cl. 252-188.000.

Silberberg, George G.; Keller, Pat N.; and White, Richard O., to United States of America, Navy. Phase controlled shuttering system. 4,171,529, Cl. 358-209.000.

Silicon Technology Corporation: *See—*
Steere, Robert E., Jr., 4,171,006, Cl. 137-595.000.

Simi, Victor M.; and Soderman, Donald A., to International Business Machines Corporation. Improved process to form bucket brigade device. 4,171,229, Cl. 148-1.500.

Sinclair, Walter, to Lucas Industries Limited. Circuits for heating storage batteries. 4,171,508, Cl. 320-2.000.

Sindelar, Joseph C.: *See—*
Carver, George E.; and Sindelar, Joseph C., 4,171,116, Cl. 248-464.000.

Singer Company, The: *See—*
Dobrjanskyj, Leo, 4,170,951, Cl. 112-278.000.

Sinha, Ashok K.: *See—*
Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; Sinha, Ashok K.; and Wang, David N., 4,171,489, Cl. 250-510.000.

Sircar, Shivaji, to Air Products and Chemicals, Inc. Separation of multicomponent gas mixtures. 4,171,206, Cl. 55-26.000.

Sircar, Shivaji, to Air Products and Chemicals, Inc. Separation of multicomponent gas mixtures by pressure swing adsorption. 4,171,207, Cl. 55-26.000.

Skoch, Leroy V.; and Hodge, Dean E., to Ralston Purina Company. Animal feed block containing magnesium oxide. 4,171,385, Cl. 426-658.000.

Skoch, Leroy V.; Harmon, Bud G.; and Dickerson, Charles W., to Ralston Purina Company. Animal feed block containing ferrous sulfate and magnesium oxide. 4,171,386, Cl. 426-658.000.

Skoch, Leroy V.: *See—*
Harmon, Bud G.; Skoch, Leroy V.; and Dickerson, Charles W., 4,171,379, Cl. 426-2.000.

Skulnick, Harvey I., to Upjohn Company, The. Nucleosides and process. 4,171,431, Cl. 536-23.000.

Sky Bussan Kabushiki Kaisha: *See—*
Hakata, Yoshihisa; and Nakazawa, Masahiro, 4,170,981, Cl. 126-43.000.

Slegten, Pierre A. Partitions for a tube grinding mill. 4,171,102, Cl. 241-70.000.

Sloan, Albert E.; and Wild, Arthur, to Caterpillar Tractor Co. Thyristor pulse control circuits. 4,171,532, Cl. 361-13.000.

Smart, Ian R. Method and device for foreign language learning and teaching by means of recordings. 4,170,834, Cl. 35-35.00C.

Smith, Alfred J., to British Nuclear Fuels Ltd. Nuclear fuel transportation containers. 4,171,002, Cl. 134-166.00R.

Smith, Clyde K., to Ohio Agricultural Research and Development Center. Vaccine for animal respiratory diseases. 4,171,354, Cl. 424-92.000.

Smith, Donald W.: *See—*
Swisher, George W., Jr.; Smith, Donald W.; and Phillips, John F., 4,171,147, Cl. 299-39.000.

Smith, Ernest L., to Phillips Petroleum Company. Closure assembly and container sealed therewith. 4,171,084, Cl. 229-43.000.

Smith, Herman W., to Upjohn Company, The. Tri-halo prostaglandin intermediates. 4,171,447, Cl. 560-121.000.

Smith, Joseph A., to Sandoz, Inc. Preparation of quinazolin-2(1H)-ones. 4,171,441, Cl. 544-286.000.

Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,171,325, Cl. 260-551.00C.

Smith, Leon. Hammer action of a revolver. 4,170,837, Cl. 42-65.000.

Smith, Leslie H., to Imperial Chemical Industries Limited. Alkanolamine derivatives. 4,171,374, Cl. 424-304.000.

Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., to Union Carbide Corporation. Derivatives of ester diol alkoxylates and compositions thereof. 4,171,423, Cl. 528-289.000.

Smith, Richard E.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,171,131, Cl. 271-236.000.

Smith, William L.: *See—*
Germack, Walter F.; and Smith, William L., 4,170,960, Cl. 123-198.00A.

SmithKline Corporation: *See—*
Berges, David A., 4,171,362, Cl. 424-246.000.
Berges, David A., 4,171,368, Cl. 424-246.000.
Berges, David A., 4,171,433, Cl. 544-26.000.
Hill, David T., 4,171,360, Cl. 424-245.000.
Weinstock, Joseph, 4,171,359, Cl. 424-244.000.

Smyslov, Vladislav V.: *See—*
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.

Smyth, Milagros B.; and Lee-You, James, to Johnson & Johnson. Fluorescent artificial teeth. 4,170,823, Cl. 32-8.000.

Snyder, Philip; and Freedman, David, to New Brunswick Scientific Co., Inc. Method and apparatus for filling petri dishes. 4,170,861, Cl. 53-468.000.

S.A. Etablissements Francois Salomon & Fils: *See—*
Riedel, Tilo, 4,171,138, Cl. 280-605.000.

Societe Anonyme: La Telemecanique Electrique: *See—*
Bouteille, Daniel, 4,171,007, Cl. 137-599.000.

Societe d'Etudes, de Realisations et d'Applications Techniques: *See—*
Precoul, Michel, 4,170,940, Cl. 102-56.0SC.

Societe Europeenne de Propulsion: *See—*
Reichard, Michel; and Krassoulia, Georges, 4,170,941, Cl. 102-202.000.

Societe Nationale Elf Aquitaine (Production), Tour Aquitaine: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,171,175, Cl. 405-170.000.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Burdet, Michel, 4,170,870, Cl. 58-50.00R.

Soderlund, Bengt, to AB Gustavsberg. Mountable storage furniture. 4,171,150, Cl. 312-107.000.

Soderman, Donald A.: *See—*
Simi, Victor M.; and Soderman, Donald A., 4,171,229, Cl. 148-1.500.

Somfai, Eva: *See—*
Huhn, Magda; Szabo, Gabor; Resofszki, Gabor; and Somfai, Eva, 4,171,303, Cl. 260-239.100.

Sommer, Gordon M., to G. M. Sommer Company, Inc. Clutch unit. 4,171,038, Cl. 192-70.130.

Soncarato, Joseph C.: *See—*
Gottier, Paul, 4,170,982, Cl. 126-99.00A.

Sonoco Products Company: *See—*
Beasley, Marion W.; Carroll, Harlan L.; and Brooking, Hurley R., 4,170,928, Cl. 93-37.00R.

Souma, Teruo; and Katagiri, Masayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Car disc brake improved in friction pad mounting. 4,171,037, Cl. 188-73.500.

Sperry Rand Corporation: *See—*
Osder, Stephen S., 4,171,115, Cl. 244-181.000.
Wagstaff, Robert A.; Jenny, Bernard T.; and Risser, Roger L., 4,171,180, Cl. 414-502.000.

Spil-Les: *See—*
Howard, James S.; and Ortiz, Joseph F., 4,171,060, Cl. 220-254.000.

Stahl-Urban Company: *See—*
Conner, William R., Jr., 4,171,076, Cl. 223-72.000.

Stahly, Frederick A.: *See—*
Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., 4,171,275, Cl. 252-62.10L.

Stal-Laval Turbin AB: *See—*
Kyrklund, Ben, 4,170,874, Cl. 60-39.18C.

Stamicarbon, B.V.: *See—*
Klein, Joseph F. M.; Stijfs, Petrus A. M. J.; and Thoma, Jozef A., 4,171,326, Cl. 260-586.00C.
van Hardeveld, Rudolf; and Hendriks, Petrus F. A. M., 4,171,091, Cl. 239-8.000.

Standard Oil Company, The: *See—*
Miller, Arthur F.; Callahan, James L.; and Shaw, Wilfrid G., 4,171,454, Cl. 562-546.000.

Standard Oil Company (Indiana): *See—*
Balint, Nikolaus K., 4,171,284, Cl. 252-429.00B.
Faust, Paul J.; and Pless, Otto C., Jr., 4,171,343, Cl. 423-359.000.
Mieville, Rodney L., 4,171,290, Cl. 252-466.0PT.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Pneumatic registration apparatus. 4,171,131, Cl. 271-236.000.

Stanley Electric Co., Ltd.: *See—*
Shinoda, Arihiro, 4,171,497, Cl. 313-113.000.

Stauffer Chemical Company: *See—*
Kuhn, Leroy B., 4,171,428, Cl. 528-502.000.
Weil, Edward D., 4,171,271, Cl. 252-46.600.

Steele, Richard S., to Reilly, John E. Hydroponic gardening method and system. 4,170,844, Cl. 47-62.000.

Steere, Robert E., Jr., to Silicon Technology Corporation. Fluid metering valve. 4,171,006, Cl. 137-595.000.

Stephens, Mark L.; and Gray, Paul R., to Signetics Corporation. Bridge drive circuit and method. 4,171,509, Cl. 323-75.00C.

Sterling Drug Inc.: *See—*
Collins, Joseph C.; and Diana, Guy D., 4,171,376, Cl. 424-308.000.
Collins, Joseph C., 4,171,378, Cl. 424-331.000.
Diana, Guy D.; and Carabateas, Philip M., 4,171,365, Cl. 424-273.00P.
Diana, Guy D., 4,171,371, Cl. 424-282.000.

Doyle, Ross L.; and Harrison, Thomas S., 4,171,047, Cl. 206-210.000.
Steyert, William A., Jr., to United States of America, Energy. High specific heat superconducting composite. 4,171,464, Cl. 174-126.00S.
Stichting Energieonderzoek Centrum Nederland: *See*—
Theyse, Frederik H., 4,171,491, Cl. 290-1.00R.
Stijfs, Petrus A. M. J.: *See*—
Klein, Joseph F. M.; Stijfs, Petrus A. M. J.; and Thoma, Jozef A., 4,171,326, Cl. 260-586.00C.
Stoller, Benjamin B. Synthetic casing for mushroom beds. 4,170,842, Cl. 47-1.100.
Storni, Angelo: *See*—
Blattner, Hans; and Storni, Angelo, 4,171,366, Cl. 424-273.00R.
Strathman, Lyle R., to Rockwell International Corporation. Constant writing speed arc scan CRT display system. 4,171,504, Cl. 315-378.000.
Straub, Hermann, to Sulzer Brothers Limited. Arrangement for mounting tubes in a tank wall. 4,171,014, Cl. 165-11.000.
Streamlight, Inc.: *See*—
Strowe, Robert J., 4,171,534, Cl. 362-183.000.
Strickland, James R., Jr. Apparatus for injecting fluid in soil. 4,170,948, Cl. 111-7.100.
Strole, Ulrich: *See*—
Friess, Hans; Kettenbach, Fritz; Farber, Jurgen; Witter, Karl T.; and Strole, Ulrich, 4,171,064, Cl. 220-418.000.
Strowe, Robert J., to Streamlight, Inc. Rechargeable flashlight. 4,171,534, Cl. 362-183.000.
Stubbings, James H., to Potomac Applied Mechanics, Inc. Angle iron cutting. 4,170,910, Cl. 83-71.000.
Stubbs, Vincent K.; Downing, Francis S.; and Marrs, Gordon J., to ICI Australia Limited. Certain tickicidal pyrethroid mixtures and stabilizer therefor. 4,171,355, Cl. 424-174.000.
Stumpp, Gerhard: *See*—
Wessel, Wolf; and Stumpp, Gerhard, 4,170,967, Cl. 123-32.0EE.
Sturges, James R., to Caterpillar Tractor Co. Triple tractor assembly. 4,171,023, Cl. 172-801.000.
Suekane, Junnosuke: *See*—
Onishi, Kimimasa; Ichimatsu, Eiji; Nagashima, Mamoru; Suekane, Junnosuke; and Ogawa, Mikiyoshi, 4,171,008, Cl. 139-339.000.
Sullivan, Paul J.; and Bridge, Ernest, Jr., to Sullivan, Paul J. Kissing doll. 4,170,841, Cl. 46-171.000.
Sulzer Brothers Limited: *See*—
Straub, Hermann, 4,171,014, Cl. 165-11.000.
Sumitomo Chemical Company, Limited: *See*—
Hoshino, Taiji; Okubo, Masao; and Miki, Masayoshi, 4,171,218, Cl. 75-128.00C.
Summa Corporation: *See*—
Korkosz, Gregory J., 4,170,896, Cl. 73-66.000.
Sun Oil Company: *See*—
Zupanick, Joseph E., 4,170,894, Cl. 73-30.000.
Sunbeam Plastics Corporation: *See*—
Gach, Peter P., 4,171,057, Cl. 215-211.000.
Sundberg, Hardy M. Apparatus for treating waste matter. 4,170,797, Cl. 4-300.000.
Sung, Rodney L.; and Zoleski, Benjamin H., to Texaco Inc. Sulfurized lubricant composition. 4,171,269, Cl. 252-33.000.
Sung, Rodney L.; Zoleski, Benjamin H.; Morris, Herbert C.; and Schallenberg, Elmer E., to Texaco Inc. Sulfurized overbased calcium alkylphenolate lubricant composition. 4,171,270, Cl. 252-42.700.
Suntech, Inc.: *See*—
Butte, Walter A., Jr.; and Cherry, Wesley R., 4,171,322, Cl. 260-465.600.
Suzuki, Kenichi: *See*—
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Hisayuki, Terumi, 4,171,328, Cl. 260-604.00R.
Suzuki, Masato: *See*—
Kiwaki, Hisakatsu; Ibamoto, Masahiko; Suzuki, Masato; Toyama, Jinichi; and Kuriyama, Shigeru, 4,171,510, Cl. 323-89.00M.
Suzuki, Takahiko: *See*—
Kageyama, Hidehei; and Suzuki, Takahiko, 4,171,170, Cl. 401-65.000.
Suzuki, Teruki: *See*—
Tanimizu, Shinkichi; Suzuki, Teruki; and Fukuzawa, Tadashi, 4,171,501, Cl. 313-486.000.
Suzuki, Yoshiro, to Olympus Optical Co., Ltd. Improved electrophotographic apparatus for multiple copies. 4,171,157, Cl. 355-3.0TR.
SW (Delaware), Inc.: *See*—
Gallant, James O., 4,171,034, Cl. 184-6.240.
Swartwout, Everett W., to Vikor Company, Inc. Type head cleaner. 4,171,167, Cl. 400-702.000.
Swinbanks, Malcolm A., to National Research Development Corporation. Active control of sound waves. 4,171,465, Cl. 179-1.00P.
Swisher, George W., Jr.; Smith, Donald W.; and Phillips, John F., to CMI Corporation. Flywheel for a construction machine. 4,171,147, Cl. 299-39.000.
Swiss Aluminium Ltd.: *See*—
Bolliger, Max; and Severus-Laubenfeld, Harald, 4,171,230, Cl. 148-6.100.
SWS Silicones Corporation: *See*—
McAfee, Richard C.; and Craig, Jerold A., 4,171,267, Cl. 252-8.600.
Syncro Corporation: *See*—
Carmichael, Thomas F.; and Dolecek, Albert J., 4,170,977, Cl. 123-148.0CC.
Syva Company: *See*—
Blakemore, Judith I.; Leute, Richard K.; and Ernst, Roberta D., 4,171,244, Cl. 435-188.000.
Szabo, Gabor: *See*—
Huhn, Magda; Szabo, Gabor; Resofszki, Gabor; and Somfai, Eva, 4,171,303, Cl. 260-239.100.
Szala, Lawrence E.: *See*—
Lee, Minyoung; Szala, Lawrence E.; and De Vries, Robert C., 4,171,339, Cl. 264-332.000.
Szerszamgepipari Muvek: *See*—
Horvath, Kalman; and Erenyi, Bruno, 4,170,850, Cl. 51-165.00R.
Taisei Corporation: *See*—
Yamada, Kunimitsu, 4,171,176, Cl. 405-257.000.
Takaaki, Ota, to Toyota Jidosha Kogyo Kabushiki Kaisha. Disc brake assembly and guide structure therefor. 4,171,035, Cl. 188-73.300.
Takahashi, Masayuki: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, 4,171,298, Cl. 260-45.85H.
Takakura, Koichi: *See*—
Nakashima, Toshihide; and Takakura, Koichi, 4,171,283, Cl. 252-428.000.
Takara Co., Ltd.: *See*—
Ogawa, Iwakichi, 4,170,840, Cl. 46-22.000.
Takeda Chemical Industries, Ltd.: *See*—
Mochizuki, Kazutaka, 4,171,305, Cl. 260-239.30R.
Takeki, Ando: *See*—
Shima, Seiya; Kuroha, Hiroaki; Takeki, Ando; Inaba, Hiromi; Kurosawa, Toshiaki; Terunuma, Mutsuhiro; and Sakai, Yoshio, 4,171,505, Cl. 318-316.000.
Talwani, Muhammad Y. Rotatable hanging planter mount. 4,170,843, Cl. 47-39.000.
Tanaka, Ryoichi; and Adachi, Tadao, to Kubota, Ltd. Work vehicle with hydraulic circuit for swivel motor and work assembly arm motor. 4,171,054, Cl. 414-687.000.
Tanaka, Tsuneo: *See*—
Nagata, Seiichi; Tanaka, Tsuneo; and Fukai, Masakazu, 4,171,234, Cl. 148-175.000.
Tang, Reginald T.: *See*—
Mares, Frank; Jacobson, Stephen E.; and Tang, Reginald T., 4,171,313, Cl. 260-343.000.
Tanimizu, Shinkichi; Suzuki, Teruki; and Fukuzawa, Tadashi, to Hitachi, Ltd. Light emitting devices based on the excitation of phosphor screens. 4,171,501, Cl. 313-486.000.
Tanimoto, Tateo; Hiasa, Yukio; Tsukamoto, Hidehiko; Ichikizaki, Tetsuo; Shindo, Akihiro; and Wakayama, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Method and apparatus for roll-forming an end plate. 4,170,889, Cl. 72-85.000.
Taniwaki, Genshi, to Kongo Co., Ltd. Sliding door. 4,170,848, Cl. 49-358.000.
Tatetsuki, Kuniharu; Hanahara, Tohru; Nakano, Takeshi; and Morisue, Kazushige, to Matsushita Electric Works, Ltd. Photoelectric smoke detector. 4,171,490, Cl. 250-564.000.
Tauster, Samuel J.: *See*—
Vannice, M. Albert; and Tauster, Samuel J., 4,171,320, Cl. 260-449.00R.
Tawfik, David A.; and Feintuch, Martin W., to Bendix Corporation, The. Power strobed digital computer system. 4,171,539, Cl. 364-900.000.
Taylor, David H.; Grant, Hendrie J.; and Shirek, Lawrence J., to Thermo King Corporation. Eccentric positioning means for a reversible pump. 4,171,192, Cl. 418-32.000.
Taylor, Robert W.: *See*—
Haynes, Harold G.; and Taylor, Robert W., 4,171,372, Cl. 424-282.000.
Team, Inc.: *See*—
Harrison, George W., 4,171,142, Cl. 285-10.000.
Technical Drilling Tools, Inc.: *See*—
Bassinger, Grey, 4,171,025, Cl. 175-65.000.
Teger, Gerhard: *See*—
Lippacher, Wolfgang; Teger, Gerhard; and Reitberger, Rudolf, 4,171,083, Cl. 227-69.000.
Tektronix, Inc.: *See*—
Long, Gordon D., 4,171,515, Cl. 325-436.000.
Telex Communications, Inc.: *See*—
Flygstad, Dean W.; and Aronoff, Michael I., 4,171,082, Cl. 226-196.000.
Terunuma, Mutsuhiro: *See*—
Shima, Seiya; Kuroha, Hiroaki; Takeki, Ando; Inaba, Hiromi; Kurosawa, Toshiaki; Terunuma, Mutsuhiro; and Sakai, Yoshio, 4,171,505, Cl. 318-316.000.
Tetivkin, Jury V.: *See*—
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.
Texaco Inc.: *See*—
Koniz, Leon F.; and Estes, John H., 4,171,329, Cl. 585-487.000.
Sung, Rodney L.; and Zoleski, Benjamin H., 4,171,269, Cl. 252-33.000.
Sung, Rodney L.; Zoleski, Benjamin H.; Morris, Herbert C.; and Schallenberg, Elmer E., 4,171,270, Cl. 252-42.700.
Waldbillig, James O.; and Rubin, Isaac D., 4,171,273, Cl. 252-51.50A.
Textron, Inc.: *See*—
Vanover, Wallace F.; and Rieth, Kurt A., 4,170,871, Cl. 59-82.000.
Vanover, Wallace F.; and Rieth, Kurt A., 4,170,872, Cl. 59-82.000.

Th. Goldschmidt AG: *See—*
Finster, Theodor; Fricke, Hans-Dieter; and Schumann, Horst, 4,171,232, Cl. 148-24.000.

Themy, Tim. Chlorine generation apparatus. 4,171,256, Cl. 204-239.000.

Theobald, Hans; Adolphi, Heinrich; and Eicken, Karl, to BASF Aktiengesellschaft. Cyclopropylmethylphosphoric acid derivatives. 4,171,357, Cl. 424-224.000.

Thermal Con-Serv Corp.: *See—*
Brown, Timothy S., 4,171,209, Cl. 55-466.000.

Thermo King Corporation: *See—*
Taylor, David H.; Grant, Hendrie J.; and Shirek, Lawrence J., 4,171,192, Cl. 418-32.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile leveling, lining and ballast packing machine. 4,170,942, Cl. 104-7.00B.

Theyse, Frederik H., to Stichting Energieonderzoek Centrum Nederland. Plant for generating and accumulating electric energy with the aid of wind power or solar energy. 4,171,491, Cl. 290-1.00R.

Thoma, Jozef A.: *See—*
Klein, Joseph F. M.; Stijfs, Petrus A. M. J.; and Thoma, Jozef A., 4,171,326, Cl. 260-586.00C.

Thomas, R. Marvin: *See—*
Seifert, Peter; Chupka, David E.; Getz, Lynn L.; Hatton, Derald R.; Thomas, R. Marvin; Osso, John M.; and Rogl, Herbert A., 4,171,101, Cl. 241-30.000.

Thomis, Wendl: *See—*
Doyle, Holly T.; Doyle, Robert O.; and Thomis, Wendl, 4,171,135, Cl. 273-237.000.

Thomson-CSF: *See—*
Gerard, Rene; and Lacombat, Michel, 4,171,162, Cl. 356-401.000.

Thun, Werner: *See—*
Birkenfeld, Richard; Thun, Werner; and Aka, Peter, 4,171,178, Cl. 414-45.000.

Tillotson, John G. Method and apparatus for forming a layer of foam urethane on a carpet backing and product. 4,171,395, Cl. 428-95.000.

Timex Corporation: *See—*
Boyles, Robert L., 4,171,471, Cl. 200-38.00D.

Tirtiaux, Robert: *See—*
Marin, Pierre D.; Prillieux, Marcel; and Tirtiaux, Robert, 4,171,323, Cl. 260-501.190.

Titus, Wallace J.: *See—*
Zahn, Frederick E.; Checkley, David L.; and Titus, Wallace J., 4,171,126, Cl. 266-250.000.

Toagosei Chemical Industry Co., Ltd.: *See—*
Motegi, Akira; Isowa, Eiji; and Kimura, Kaoru, 4,171,416, Cl. 526-245.000.

Toal, Ted W.: *See—*
Weissberger, Alan J.; and Toal, Ted W., 4,171,537, Cl. 364-704.000.

Tobey, Morley C., Jr.; Giuliani, David J.; and Ashkin, Peter B., to Hewlett-Packard Company. Barrier height voltage reference. 4,170,818, Cl. 29-571.000.

Tokitsu, Tetsuya, to Chugairo Kogyo Kaisha Ltd. Method of operating a reheating furnace in hot rolling line. 4,170,815, Cl. 29-527.700.

Tokumitsu, Sinichi: *See—*
Kyo, Kayomon; Hirose, Katsuhiro; Yasue, Kenji; Tokumitsu, Sinichi; and Kohyama, Haruo, 4,171,330, Cl. 525-180.000.

Tokyo Shibaura Electric Company, Limited: *See—*
Higa, Osamu; and Seki, Nagataka, 4,171,517, Cl. 328-72.000.

Tomita, Kenichi; Uehara, Keiichi; Torii, Kenji; Okuda, Takahiro; Katsura, Hakuji; and Hirano, Isao, to Shiseido Company Ltd. Polyoxypropylene polyoxyethylene addition ether of higher branched primary saturated alcohol. 4,171,455, Cl. 568-625.000.

Tomita, Yosiaki: *See—*
Mima, Yoshitada; Kanno, Youji; Sato, Nobuo; Hara, Yasuhiko; Tomita, Yosiaki; Karakawa, Takuro; Miyamoto, Masahiro; and Kano, Toshitaka, 4,171,481, Cl. 250-223.00B.

Torii, Kenji: *See—*
Tomita, Kenichi; Uehara, Keiichi; Torii, Kenji; Okuda, Takahiro; Katsura, Hakuji; and Hirano, Isao, 4,171,455, Cl. 568-625.000.

Toshev, Vassil S.; Patov, Yordan G.; and Angelova, Emilia I., to Vish Chimiko-Technologicheski Institute. Method of manufacture of reinforcing carbon black. 4,171,345, Cl. 423-450.000.

Toshihisa, Suga. Automotive safeguard for protecting occupants. 4,171,140, Cl. 280-749.000.

'Totes', Incorporated: *See—*
Kopin, Sheldon A., 4,171,011, Cl. 150-34.000.

Towmotor Corporation: *See—*
Chelin, Charles R., 4,171,181, Cl. 414-636.000.

Townsend, Richard E., to United States of America, Air Force. Shift mechanism for aircraft control system. 4,171,113, Cl. 244-83.00G.

Toyama, Jinichi: *See—*
Kiwaki, Hisakatsu; Ibamoto, Masahiko; Suzuki, Masato; Toyama, Jinichi; and Kuriyama, Shigeru, 4,171,510, Cl. 323-89.00M.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Matsushita, Susumu; and Ikushige, Tetsuo, 4,171,430, Cl. 536-8.000.

Toyooka, Morio: *See—*
Nohara, Yasumoto; Harada, Yukio; Toyooka, Morio; and Harada, Takashi, 4,171,049, Cl. 206-328.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Noguchi, Masaaki; Sekiya, Setsuro; and Motosugi, Kashuhiko, 4,170,968, Cl. 123-32.0SP.
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,170,973, Cl. 123-119.00A.
Souma, Teruo; and Katagiri, Masayoshi, 4,171,037, Cl. 188-73.500.
Takaaki, Ota, 4,171,035, Cl. 188-73.300.

Trager, Seymour F.: *See—*
Green, Keith; and Trager, Seymour F., 4,171,377, Cl. 424-319.000.

Trane Company, The: *See—*
Jehn, Thomas C.; Roraff, Francis J.; and Bauers, Gerald T., 4,170,964, Cl. 122-235.00G.

Treuner, Uwe D.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,171,435, Cl. 544-29.000.

TRI/Valley Growers: *See—*
Malvick, Arnold O.; MacDonald, Wayne W.; and Beckwith, Carl M., 4,171,158, Cl. 356-239.000.

Trowbridge, Frank R.; Bryan, Walter B.; and Price, Charles R., to Morehouse Industries, Inc. Dispersing apparatus with grooved impeller. 4,171,166, Cl. 366-316.000.

Trubkin, Valery E.: *See—*
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.

TRW Inc.: *See—*
Murray, Ronald A.; and Wright, Peter D., 4,170,855, Cl. 52-400.000.

Tsernes, Vladimir Y.: *See—*
Zhukov, Evgeny I.; Kichulkin, Viktor A.; Tsernes, Vladimir Y.; Shekhel, Alexandr B.; Kershenbaum, Naum Y.; Senderov, Evgeny N.; and Ivoilov, Oleg G., 4,170,944, Cl. 104-138.00R.

Tsuboi, Takashi: *See—*
Horiuchi, Michimasa; Narita, Hiroshi; and Tsuboi, Takashi, 4,171,506, Cl. 318-338.000.

Tsuda, Shin, to Canon Kabushiki Kaisha. Circuit for preventing breakdown of a load resulting from wrong connection of a power source. 4,171,512, Cl. 324-133.000.

Tsukamoto, Hidehiko: *See—*
Tanimoto, Tateo; Hiasa, Yukio; Tsukamoto, Hidehiko; Ichikizaki, Tetsuo; Shindo, Akihiro; and Wakayama, Akira, 4,170,889, Cl. 72-85.000.

Tsunefuji, Katsuhiko, to Olympus Optical Co., Ltd. Electromagnetic shutter apparatus for camera. 4,171,156, Cl. 354-209.000.

Tuba, Zoltan; and Marsai, Maria, to Richter Gedeon Vegyeszeti Gyar Rt. Diepoxy-androstanes and a process for the preparation thereof. 4,171,306, Cl. 260-239.55R.

Tull, Roger J.: *See—*
Shinkai, Ichiro; Weinstock, Leonard M.; and Tull, Roger J., 4,171,440, Cl. 544-277.000.

Turkova, Jaroslava: *See—*
Coupek, Jiri; Turkova, Jaroslava; Blaha, Karel; and Valentova, Olga, 4,171,412, Cl. 525-329.000.

Turnbull, John C., to RCA Corporation. Method for coating cathode material on cathode substrate. 4,170,811, Cl. 29-25.160.

Tuxis Corporation: *See—*
Ehrenfreund, Herbert A., 4,171,411, Cl. 521-98.000.

Tuznik, Franciszek; and Lis, Andrzej, to Instytut Mechaniki Precyzyjnes. Apparatus for recovery of metals from metal plating baths and neutralizing toxic effluents therefrom. 4,171,255, Cl. 204-238.000.

Twombly, Donald F.: *See—*
Janes, George S.; Litzenberger, Leonard N.; and Twombly, Donald F., 4,171,462, Cl. 13-31.0EB.

Ube Industries Ltd.: *See—*
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Hisayuki, Terumi, 4,171,328, Cl. 260-604.00R.

Uehara, Keiichi: *See—*
Tomita, Kenichi; Uehara, Keiichi; Torii, Kenji; Okuda, Takahiro; Katsura, Hakuji; and Hirano, Isao, 4,171,455, Cl. 568-625.000.

Uhle, Klaus P. Smoking device. 4,171,000, Cl. 131-170.00A.

Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Hisayuki, Terumi, to Ube Industries Ltd. Catalytic oxidation of isobutylene. 4,171,328, Cl. 260-604.00R.

Union Carbide Corporation: *See—*
Chiu, Herman S., 4,171,381, Cl. 426-105.000.
Rosen, Meyer R.; Braun, David B.; and Drap, Stephen, 4,171,337, Cl. 264-56.000.
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,171,423, Cl. 528-289.000.

Union Oil Company of California: *See—*
Hass, Robert H., 4,171,347, Cl. 423-539.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Higgs, Victor W., 4,170,792, Cl. 2-10.000.

United States Gypsum Company: *See—*
Walker, Keith W., 4,170,858, Cl. 52-735.000.

United States of America
Agriculture: *See—*
Frank, Arlen W., 4,171,448, Cl. 560-158.000.
Air Force: *See—*
Conkle, James P.; Lackey, William W.; and Martin, Charles L., 4,170,901, Cl. 73-421.50R.
Edwards, Lawrence J., 4,170,875, Cl. 60-253.000.
Honeycutt, Fred L., Jr.; and Senterfitt, Donald R., 4,171,093, Cl. 239-127.300.
Kilmer, LeMoyne L., 4,170,923, Cl. 89-1.819.
Townsend, Richard E., 4,171,113, Cl. 244-83.00G.
Commerce: *See—*
Fujita, Tetsuya T.; and Bedard, Alfred J., Jr., 4,170,899, Cl. 73-189.000.
Energy: *See—*

Adam, Milton F., 4,170,817, Cl. 29-450.000.
Steyert, William A., Jr., 4,171,464, Cl. 174-126.00S.
Navy: *See—*
Bauer, Peter W., 4,171,526, Cl. 346-23.000.
Fischell, Robert E.; Fountain, Glen H.; Mobley, Frederick F.; and Sadilek, Albert C., 4,170,904, Cl. 74-5.60E.
Peterson, Gary L.; and Liedtke, Larry L., 4,170,922, Cl. 89-7.000.
Seeley, Elwin W., 4,171,525, Cl. 343-853.000.
Silberberg, George G.; Keller, Pat N.; and White, Richard O., 4,171,529, Cl. 358-209.000.
U.S. Philips Corporation: *See—*
Beale, Julian R. A., 4,171,029, Cl. 180-54.00R.
de Leeuw, Franciscus H., 4,171,408, Cl. 428-539.000.
Groothuis, Gerrit J.; and de Vries, Tjamme, 4,170,822, Cl. 30-43.920.
Lorteije, Jean H. J.; Warrink, Geert; deVries, Gerhard H. F.; and Hulshof, Jacques A. M., 4,171,524, Cl. 340-713.000.
Molenaar, Arian; Van Den Bogaert, Henricus M.; and Boven, Jan, 4,171,225, Cl. 106-1.230.
van Lieshout, Johannes M. J., 4,171,500, Cl. 313-331.000.
Wulms, Christiaan J. G. H., 4,171,480, Cl. 250-213.0VT.
United Technologies Corporation: *See—*
Cornell, Robert W.; and Rohrbach, Carl, 4,171,183, Cl. 416-94.000.
Fowler, Michael C., 4,171,251, Cl. 204-158.00R.
Unitika Ltd.: *See—*
Kyo, Kayomon; Hirose, Katsuhiro; Yasue, Kenji; Tokumitsu, Sinichi; and Kohyama, Haruo, 4,171,330, Cl. 525-180.000.
University of Alabama in Birmingham: *See—*
Krumdieck, Carlos L., 4,170,798, Cl. 4-319.000.
University of California, The Regents of the: *See—*
Hamburger, Robert N., 4,171,299, Cl. 260-112.50R.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,171,319, Cl. 260-413.000.
Bundy, Gordon L., 4,171,327, Cl. 260-586.00R.
Hoeksema, Herman, 4,171,436, Cl. 544-99.000.
Hoeksema, Herman, 4,171,437, Cl. 544-99.000.
Nelson, Norman A., 4,171,460, Cl. 568-838.000.
Skulnick, Harvey I., 4,171,431, Cl. 536-23.000.
Smith, Herman W., 4,171,447, Cl. 560-121.000.
Utumi, Masahiro: *See—*
Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Yoneyama, Masakazu, 4,171,406, Cl. 428-447.000.
Vachon, Marcel O.: *See—*
Quinn, Cassandrasu D.; and Vachon, Marcel O., 4,170,833, Cl. 35-36.000.
Valentova, Olga: *See—*
Coupek, Jiri; Turkova, Jaroslava; Blaha, Karel; and Valentova, Olga, 4,171,412, Cl. 525-329.000.
Vanauto Accessories Proprietary Limited: *See—*
Scotcher, Douglas E., 4,170,804, Cl. 15-250.340.
Van Den Bogaert, Henricus M.: *See—*
Molenaar, Arian; Van Den Bogaert, Henricus M.; and Boven, Jan, 4,171,225, Cl. 106-1.230.
van den Haak, Gerardus M.: *See—*
Dorrepaal, Wim; van den Haak, Gerardus M.; Weehuizen, Joseph M.; and Aalbers, Johan G., 4,171,261, Cl. 209-166.000.
van der Lely, Cornelis. Soil cultivating implements. 4,171,021, Cl. 172-63.000.
van der Lely, Cornelis. Articulated tractor having tandem power unit. 4,171,028, Cl. 180-235.000.
van der Meulen, Leonard. Apparatus for depositing lengths of foil material. 4,170,927, Cl. 93-33.00H.
van der Veek, Augustinus P. M., to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek ten Behoeve Van Nijverheid, Handel En Verkeer. Telluryl compounds, their preparation and use. 4,171,351, Cl. 424-1.000.
Vander Voort, George F., to Bethlehem Steel Corporation. Lens quality of die steel. 4,171,233, Cl. 148-36.000.
van Hardeveld, Rudolf; and Hendriks, Petrus F. A. M., to Stamicarbon, B.V. Process and device for spraying liquid. 4,171,091, Cl. 239-8.000.
Van Hook, Danny A.: *See—*
Osborne, Edward T.; and Van Hook, Danny A., 4,171,527, Cl. 346-75.000.
Van Keilegom, Roland: *See—*
Verhille, Karel E.; Biermans, Paul V.; and Van Keilegom, Roland, 4,171,224, Cl. 96-94.00R.
van Lieshout, Johannes M. J., to U.S. Philips Corporation. Electric lamp. 4,171,500, Cl. 313-331.000.
Vannice, M. Albert; and Tauster, Samuel J., to Exxon Research & Engineering Co. Hydrocarbon synthesis from CO and H_2 using Ru supported on group VB metal oxides. 4,171,320, Cl. 260-449.00R.
Vanover, Wallace F.; and Rieth, Kurt A., to Textron, Inc. Bracelet linkage. 4,170,871, Cl. 59-82.000.
Vanover, Wallace F.; and Rieth, Kurt A., to Textron, Inc. Bracelet linkage. 4,170,872, Cl. 59-82.000.
Van Zweeden, Adriaan: *See—*
Oosterling, Pieter A.; and Van Zweeden, Adriaan, 4,170,934, Cl. 100-100.000.
Varian Associates, Inc.: *See—*
Hill, Howard D. W., 4,171,511, Cl. 324-313.000.
Varner, George C., to Milliken Research Corporation. Printing of pattern designs with computer controlled pattern dyeing device. 4,170,883, Cl. 68-205.00R.
Vastel, Jean, to CAMECA. Mass spectrometer for ultra-rapid scanning. 4,171,482, Cl. 250-296.000.
Vencraft Corporation: *See—*
Hudson, Frederick W., 4,171,086, Cl. 232-35.000.
Vending Components, Inc.: *See—*
Cerrato, Vincent; and Hines, James, 4,171,004, Cl. 137-116.000.
Verhille, Karel E.; Biermans, Paul V.; and Van Keilegom, Roland, to AGFA-GEVAERT N.V. Method and apparatus suitable for the preparation of AgX-emulsions. 4,171,224, Cl. 96-94.00R.
Vetter, Hans; Puschel, Walter; and Marx, Paul, to AGFA-Gevaert, A.G. Photographic dye diffusion transfer process. 4,171,220, Cl. 96-29.00D.
Vikor Company, Inc.: *See—*
Swartwout, Everett W., 4,171,167, Cl. 400-702.000.
Vish Chimiko-Technologicheski Institute: *See—*
Toshev, Vassil S.; Patov, Yordan G.; and Angelova, Emilia I., 4,171,345, Cl. 423-450.000.
Vogt, Gunther: *See—*
Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, 4,171,278, Cl. 252-102.000.
Voit, Willi: *See—*
Kopse, Odon; Kinzel, Richard; Eblen, Ewald; Voit, Willi; Schuster, Gregor; and Eheim, Franz, 4,171,099, Cl. 239-533.800.
Volchenko, Alexei A.: *See—*
Planovsky, Alexandr N.; Pavlov, Vladimir P.; Trubkin, Valery E.; Fedotov, Evgeny V.; Tetivkin, Jury V.; Ershov, Oleg L.; Volchenko, Alexei A.; Pagava, Gaioz A.; Kervalishvili, Zurab Y.; Smyslov, Vladislav V.; and Belugin, Vadim F., 4,171,335, Cl. 261-155.000.
Volgenau, Lewis: *See—*
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,171,292, Cl. 260-29.6WB.
Von Brimer, Joe W., deceased: *See—*
Brimer, Claude M.; and Von Brimer, Joe W., deceased, 4,171,493, Cl. 310-13.000.
Vossen, Franz; and Vossen, Georg M., to Wupa-Maschinenfabrik GmbH. Apparatus for separating and stacking sheets of paper or the like. 4,171,081, Cl. 225-97.000.
Vossen, Georg M.: *See—*
Vossen, Franz; and Vossen, Georg M., 4,171,081, Cl. 225-97.000.
W. Ferd. Klingelnberg Sohne: *See—*
Weber, Karl-Heinz, 4,170,830, Cl. 33-174.00P.
Wagensommer, Joseph; and Manalastas, Pacifico V., to Exxon Research & Engineering Co. Catalyst composition for an improved polymerization process of isoolefins and multiolefins. 4,171,414, Cl. 526-185.000.
Wagner, Theodore R. Tool holder. 4,170,909, Cl. 81-63.200.
Wagner, Wolf-Jurgen: *See—*
Fromm, Dietrich; Seehawer, Jurgen; Wagner, Wolf-Jurgen; and Winzerling, Erich, 4,171,498, Cl. 313-229.000.
Wagstaff, Robert A.; Jenny, Bernard T.; and Risser, Roger L., to Sperry Rand Corporation. Fast acting clutching and de-clutching mechanism. 4,171,180, Cl. 414-502.000.
Wahl, Edward L.: *See—*
Jagodzinski, Richard F.; and Wahl, Edward L., 4,171,200, Cl. 432-13.000.
Wakayama, Akira: *See—*
Tanimoto, Tateo; Hiasa, Yukio; Tsukamoto, Hidehiko; Ichikizaki, Tetsuo; Shindo, Akihiro; and Wakayama, Akira, 4,170,889, Cl. 72-85.000.
Waldbillig, James O.; and Rubin, Isaac D., to Texaco Inc. Fatty alkyl succinate ester and succinimide modified copolymers of ethylene and an alpha olefin. 4,171,273, Cl. 252-51.50A.
Walker, Keith W., to United States Gypsum Company. Resilient runner for wall construction. 4,170,858, Cl. 52-735.000.
Walker-Neer Manufacturing Co., Inc.: *See—*
Reed, Thomas C., 4,171,187, Cl. 417-170.000.
Walker, Raymond W., to Deep Oil Technology, Inc. Tubing hanger assembly and method of landing and locking. 4,171,018, Cl. 166-315.000.
Waltham, Richard M., to EMI Limited. Radiography. 4,171,476, Cl. 250-445.00T.
Wang, Chi-Shin; and Jiang, Ching-Lin, to Hughes Aircraft Company. Charge-coupled analog-to-digital converter. 4,171,521, Cl. 340-347.0AD.
Wang, David N.: *See—*
Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; Sinha, Ashok K.; and Wang, David N., 4,171,489, Cl. 250-510.000.
Wanke, Georg: *See—*
Wanke, Gunter, 4,170,903, Cl. 73-480.000.
Wanke, Gunter, to Wanke, Georg. Balancing apparatus for blade sets for a cutter. 4,170,903, Cl. 73-480.000.
Ward, Milton K., to DuraCraft Boats, Inc. Fishing rod and reel box. 4,170,801, Cl. 9-1.100.
Wardlaw, Stephen C.: *See—*
Levine, Robert A.; and Wardlaw, Stephen C., 4,170,995, Cl. 128-346.000.
Warner-Lambert Company: *See—*
Booth, Anthony R., 4,170,821, Cl. 30-41.000.
Warren, Elbert K.: *See—*
Eskridge, Brewster B.; Fink, Roger H.; Porter, William D.; and Warren, Elbert K., 4,171,402, Cl. 428-369.000.
Warrink, Geert: *See—*
Lorteije, Jean H. J.; Warrink, Geert; deVries, Gerhard H. F.; and Hulshof, Jacques A. M., 4,171,524, Cl. 340-713.000.

Watanabe, Kyoichi A.; Hirota, Kosaku; Chu, Chung K.; Reichman, Uri; and Fox, Jack J., to Research Corporation. Pyrimidine to pyrimidine transformation process. 4,171,429, Cl. 536-1.000.

Watkins, David. Rodent proof cable. 4,171,463, Cl. 174-120.00R.

Watkins, Gordon L.: *See—*
Caton, Michael P. L.; Parker, Trevor; and Watkins, Gordon L., 4,171,375, Cl. 424-305.000.

Watson, Clyde D.: *See—*
Roberts, Thomas E., Jr.; Wright, Bruce M.; Watson, Clyde D.; and Abbott, John A., 4,171,263, Cl. 210-8.000.

Watson, Donald J.: *See—*
Grapes, Robert D.; and Watson, Donald J., 4,171,531, Cl. 360-99.000.

Wear, Robert L., to Minnesota Mining and Manufacturing Company. Thermally-responsive indicating device. 4,170,956, Cl. 116-218.000.

Weber, Karl-Heinz, to W. Ferd. Klingelnberg Sohne. Feeler for measuring lengths. 4,170,830, Cl. 33-174.00P.

Weehuizen, Joseph M.: *See—*
Dorrepaal, Wim; van den Haak, Gerardus M.; Weehuizen, Joseph M.; and Aalbers, Johan G., 4,171,261, Cl. 209-166.000.

Weil, Edward D., to Stauffer Chemical Company. Thiobisphenol esters of pentavalent phosphorus acids in functional fluids. 4,171,271, Cl. 252-46.600.

Weinrich, Erwin: *See—*
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,171,203, Cl. 8-10.200.

Weinstock, Joseph, to SmithKline Corporation. Benz-tetrasubstituted 1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepines. 4,171,359, Cl. 424-244.000.

Weinstock, Leonard M.: *See—*
Shinkai, Ichiro; Weinstock, Leonard M.; and Tull, Roger J., 4,171,440, Cl. 544-277.000.

Weisheit, Michael L.: *See—*
Murray, Lowell C.; Weisheit, Michael L.; and Michetti, Louis C., 4,171,050, Cl. 206-463.000.

Weiss, Franz-Josef: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; Platz, Rolf; Magnussen, Peter; and Weiss, Franz-Josef, 4,171,451, Cl. 560-204.000.

Weiss, Robert L.: *See—*
Peter, Anthony E.; Shott, Frank A.; and Weiss, Robert L., 4,170,819, Cl. 29-625.000.

Weissberger, Alan J.; and Toal, Ted W., to National Semiconductor. Number oriented processor. 4,171,537, Cl. 364-704.000.

Wellstead, Peter E.: *See—*
Munro, Neil; Wellstead, Peter E.; Carter, George A.; and Cross, Mark, 4,171,336, Cl. 264-37.000.

Welsh, John; Havrilla, John V.; and Havrilla, John W., to Welsh, John. Spray gun nozzle attachment. 4,171,096, Cl. 239-291.000.

Wenzel, Jurgen, to Maschinenbau "WAM" M. Osterhof KG. Strip positioning in label printers. 4,171,068, Cl. 226-64.000.

Werzalit-Pressholzwerk J.F. Werz Jr. KG: *See—*
Munk, Edmund E.; and Haas, Herbert G., 4,171,396, Cl. 428-171.000.

Wessel, Wolf; and Stumpp, Gerhard, to Robert Bosch GmbH. Apparatus for controlling the mixture of an internal combustion engine. 4,170,967, Cl. 123-32.0EE.

Wessel, Wolf; Grieshaber, Hermann; and Holzbaur, Siegfried, to Robert Bosch GmbH. Fuel metering valve assembly for internal combustion engines. 4,170,975, Cl. 123-139.0AW.

Wesselmann, Rudolf: *See—*
Ohorodnik, Alexander; Kaiser, Karl; and Wesselmann, Rudolf, 4,171,427, Cl. 528-500.000.

Westermann, Winfried N., to Westinghouse Electric Corp. Luminaire for concealed T ceiling systems. 4,171,535, Cl. 362-406.000.

Western Electric Company, Inc.: *See—*
Wong, Ching-Ping, 4,171,240, Cl. 156-630.000.

Westinghouse Electric Corp.: *See—*
Elsner, Hans J., 4,170,891, Cl. 73-1.00R.
Westermann, Winfried N., 4,171,535, Cl. 362-406.000.

Wheeler, Ian R., to Ciba-Geigy Corporation. Process for the preparation of a solvent-stable, red-shade copper phthalocyanine pigment composition. 4,171,309, Cl. 260-314.500.

Wheeler, Kenneth E.: *See—*
Katz, Maurice; and Wheeler, Kenneth E., 4,170,827, Cl. 33-125.00R.

Wheelock, Daniel C. Mirror accessory means for stringed musical instrument. 4,170,917, Cl. 84-319.000.

Wheelock, Kenneth S., to Exxon Research & Engineering Co. Selective automotive exhaust catalysts and a process for their preparation. 4,171,289, Cl. 252-466.0PT.

Whirlpool Corporation: *See—*
Brenner, Robert A.; and Cuthbert, Victor W., 4,170,882, Cl. 68-133.000.

White, Matthew B. Optical homodyne microscope. 4,171,159, Cl. 356-349.000.

White, Ralph L., Jr, Ralph L., to Morton-Norwich Products, Inc. 5-(4-Bromophenyl)oxazole. 4,171,307, Cl. 548-235.000.

White, Richard O.: *See—*
Silberberg, George G.; Keller, Pat N.; and White, Richard O., 4,171,529, Cl. 358-209.000.

Wiberg, Ole. Sitdown piece of furniture convertible into a bed. 4,170,800, Cl. 5-45.000.

Widding, Karl: *See—*
Harang, Hakon; Widding, Karl; Andreassen, Knut A.; and Holte, Johan B., 4,171,247, Cl. 204-34.000.

Wiedemann, Fritz; and Kampe, Wolfgang, to Boehringer Mannheim GmbH. Indazole compounds. 4,171,446, Cl. 548-372.000.

Wild, Arthur: *See—*
Sloan, Albert E.; and Wild, Arthur, 4,171,532, Cl. 361-13.000.

Wildbolz, Rudolf: *See—*
Lattmann, Werner; and Wildbolz, Rudolf, 4,171,262, Cl. 209-555.000.

William H. Rorer, Inc.: *See—*
Diamond, Julius, 4,171,373, Cl. 424-301.000.

Williams, Stanley B. Hand held washer. 4,171,169, Cl. 401-41.000.

Willmund, Wolf-Dieter: *See—*
Eschwey, Helmut; Willmund, Wolf-Dieter; and Gress, Wolfgang, 4,171,293, Cl. 260-22.00A.

Willner, Joseph: *See—*
Moore, Eugene R.; McDonald, David C.; Willner, Joseph; and Briggs, Roger L., 4,171,453, Cl. 562-406.000.

Wilmington Chemical Corporation: *See—*
Parker, Gordon M., 4,171,391, Cl. 427-246.000.

Wilson, Roger A. Power hammer. 4,171,024, Cl. 173-117.000.

Winchell, David A.; and Fowles, Thomas A., to Baxter Travenol Laboratories, Inc. Method of making frangible seal. 4,171,236, Cl. 156-69.000.

Winkelmann, Martin: *See—*
Meyer, Frank; Kubens, Rolf; and Winkelmann, Martin, 4,171,419, Cl. 528-67.000.

Winkler, Burton C., Jr.: *See—*
Otey, Charles R.; and Winkler, Burton C., Jr., 4,171,513, Cl. 325-32.000.

Winn, Martin; and Nordeen, Carl W., to Abbott Laboratories. Pyrazolyl amino imidazolines. 4,171,367, Cl. 424-273.00P.

Winn, Ronald R., to Kempler, Ernest, a part interest. Merchandise display unit. 4,171,052, Cl. 211-162.000.

Winzerling, Erich: *See—*
Fromm, Dietrich; Seehawer, Jurgen; Wagner, Wolf-Jurgen; and Winzerling, Erich, 4,171,498, Cl. 313-229.000.

Wirth, Gallo & Co.: *See—*
Gallo, Mario; and Wirth, Johannes, 4,171,026, Cl. 177-25.000.

Wirth, Johannes: *See—*
Gallo, Mario; and Wirth, Johannes, 4,171,026, Cl. 177-25.000.

Witter, Karl T.: *See—*
Friess, Hans; Kettenbach, Fritz; Farber, Jurgen; Witter, Karl T.; and Strole, Ulrich, 4,171,064, Cl. 220-418.000.

Woelkers, Virgil N. Conductor pulling device. 4,171,123, Cl. 254-134.3FT.

Woessner, Warren D.: *See—*
Biddlecom, William G.; Kluender, Harold C.; and Woessner, Warren D., 4,171,331, Cl. 260-946.000.

Wolfe, Raymond: *See—*
Gyorgy, Ernst M.; LeCraw, Roy C.; and Wolfe, Raymond, 4,171,389, Cl. 427-130.000.

Wolgemuth, Richard L.; Hanson, Kenneth M.; and Zassenhaus, Peter H., to Polysciences, Inc. Quantitative evaluation of enteric microbial overgrowth. 4,171,352, Cl. 424-9.000.

Wombold, Harry A. E.: *See—*
Allen, David O.; and Wombold, Harry A. E., 4,171,062, Cl. 220-270.000.

Wong, Ching-Ping, to Western Electric Company, Inc. Method of removing a cured epoxy from a metal surface. 4,171,240, Cl. 156-630.000.

Woods, Robert D.: *See—*
Woolslayer, Homer J.; Woods, Robert D.; and Jenkins, Cecil, 4,171,032, Cl. 182-3.000.

Woolslayer, Homer J.; Woods, Robert D.; and Jenkins, Cecil, to Lee C. Moore Corporation. Safety support for safety belts. 4,171,032, Cl. 182-3.000.

Wright, Bruce M.: *See—*
Roberts, Thomas E., Jr.; Wright, Bruce M.; Watson, Clyde D.; and Abbott, John A., 4,171,263, Cl. 210-8.000.

Wright, Ian G., to Eli Lilly and Company. N,N'-dichlorobicyclo[2.2.-2]oct-7-ene-2,3,5,6-tetracarboxylic-2,3,5,6-diimide. 4,171,310, Cl. 260-326.00C.

Wright, John J.; and Mallams, Alan K., to Schering Corporation. 2-Unsubstituted derivatives of 4,6-di-o-(aminoglycosyl)-1,3-diaminocyclitois, methods for their use as antibacterial agents and compositions useful therefor. 4,171,356, Cl. 424-180.000.

Wright, Peter D.: *See—*
Murray, Ronald A.; and Wright, Peter D., 4,170,855, Cl. 52-400.000.

Wright, R. Martin, to FMC Corporation. Turbine lubricant. 4,171,272, Cl. 252-46.700.

Wright, William V.: *See—*
Aschenbrenner, Frank A.; and Wright, William V., 4,170,866, Cl. 57-58.950.

Wu, Yeongchi, to Rehabilitation Institute of Chicago. Catheterization unit. 4,170,996, Cl. 128-349.00R.

Wullenwaber, Robert W. Apparatus for serially transporting, testing and orienting cylindrical components. 4,171,051, Cl. 209-542.000.

Wulms, Christiaan J. G. H., to U.S. Philips Corporation. Image intensifier tube. 4,171,480, Cl. 250-213.0VT.

Wupa-Maschinenfabrik GmbH: *See—*
Vossen, Franz; and Vossen, Georg M., 4,171,081, Cl. 225-97.000.

WWG Industries, Inc.: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,170,868, Cl. 57-293.000.

Xerox Corporation: *See*—
Eddy, Clifford O.; and Hoffend, Thomas R., 4,170,957, Cl. 118-60.000.
Schwarz, William M.; Karz, Robert S.; Erhardt, Peter F.; and Dickerson, Charles G., 4,171,274, Cl. 252-62.10P.
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,171,131, Cl. 271-236.000.

Yamada, Kunimitsu, to Taisei Corporation; and Neturen Co. Ltd. Flexible bar reinforced concrete pile and method of construction. 4,171,176, Cl. 405-257.000.

Yamaguchi, Kiyoshi; Maki, Naoki; and Mori, Takanobu, to Hitachi, Ltd. Electric rotary machine having superconducting rotor. 4,171,494, Cl. 310-52.000.

Yamaguchi, Masanaga: *See*—
Nishimura, Akira; Kashihara, Takanobu; Okuda, Fukuyasu; and Yamaguchi, Masanaga, 4,171,340, Cl. 422-36.000.

Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Yoneyama, Masakazu, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,171,406, Cl. 428-447.000.

Yamanaka, Minoru; and Kawabata, Yasuhiro, to Aisin Seiki Kabushiki Kaisha. Pneumatic pressure control valve assembly. 4,170,971, Cl. 123-119.00A.

Yasue, Kenji: *See*—
Kyo, Kayomon; Hirose, Katsuhiro; Yasue, Kenji; Tokumitsu, Sinichi; and Kohyama, Haruo, 4,171,330, Cl. 525-180.000.

Yeda Research and Development Co. Ltd.: *See*—
Haviv, Fortuna; and Patchornik, Abraham, 4,171,434, Cl. 544-27.000.

Yoneyama, Masakazu: *See*—
Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Yoneyama, Masakazu, 4,171,406, Cl. 428-447.000.

Youness, Michael R. Plastic swingboard bracing panel. 4,170,946, Cl. 105-493.000.

Youngflex S.A.: *See*—
Griffiths, David T., 4,171,125, Cl. 267-102.000.

Yugen-Gaisha Waikei Giken: *See*—
Kumagai, Moriji, 4,170,805, Cl. 15-321.000.

Zahn, Frederick E.; Checkley, David L.; and Titus, Wallace J., to Midland-Ross Corporation. Vacuum furnace with cooling means. 4,171,126, Cl. 266-250.000.

Zanio, Kenneth R.: *See*—
Fraas, Lewis M.; Zanio, Kenneth R.; and Knechtli, Ronald C., 4,171,235, Cl. 148-175.000.

Zassenhaus, Peter H.: *See*—
Wolgemuth, Richard L.; Hanson, Kenneth M.; and Zassenhaus, Peter H., 4,171,352, Cl. 424-9.000.

Zehner, Lee R.: *See*—
Kesling, Haven S., Jr.; and Zehner, Lee R., 4,171,450, Cl. 560-204.000.

Zeibig, Anton; and Scales, John T., to Rosenthal Technik AG. Bone joint endoprosthesis. 4,170,794, Cl. 3-1.910.

Zeidler, Ulrich: *See*—
Andree, Hans; Jakobi, Gunter; Rupilius, Wolfgang; Rutzen, Horst; Zeidler, Ulrich; Berg, Markus; Kaufmann, Jochen; and Vogt, Gunther, 4,171,278, Cl. 252-102.000.

Zern, Gordon K. Danger alarm device. 4,170,955, Cl. 116-67.00R.

Zhukov, Evgeny I.; Kichulkin, Viktor A.; Tsernes, Vladimir Y.; Shekhel, Alexandr B.; Kershenbaum, Naum Y.; Senderov, Evgeny N.; and Ivoilov, Oleg G. Arrangement for transportation of cargoes in containers. 4,170,944, Cl. 104-138.00R.

Zimmerman, Kurt E. Interactive teaching machine. 4,170,832, Cl. 35-9.00A.

Zoleski, Benjamin H.: *See*—
Sung, Rodney L.; and Zoleski, Benjamin H., 4,171,269, Cl. 252-33.000.
Sung, Rodney L.; Zoleski, Benjamin H.; Morris, Herbert C.; and Schallenberg, Elmer E., 4,171,270, Cl. 252-42.700.

Zuech, Ernest A.: *See*—
Murtha, Timothy P.; and Zuech, Ernest A., 4,171,245, Cl. 203-68.000.

Zupanick, Joseph E., to Sun Oil Company. Means, employing a fluidic oscillator, for determining the density of gas. 4,170,894, Cl. 73-30.000.

4M Biological Products and Services: *See*—
Mann, Herman C.; and Mann, Robert N., 4,171,073, Cl. 222-309.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF OCTOBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Absler, Howard K.: *See*—
Juszak, Joseph J.; and Absler, Howard K., Re. 30,114, Cl. 206-610.000.

Andersen, Ariel A., to Christensen, Phillip V., Trustee for the Foundation for Indian Development, Inc. Apparatus and method for canning food. Re. 30,112, Cl. 99-359.000.

Bell, William F.; and Van Deberg, Walter H., to F. Jos. Lamb Company. Workpiece elevator. Re. 30,113, Cl. 198-355.000.

Berkey-Colortran, Inc.: *See*—
Tichenor, Clyde L., Re. 30,119, Cl. 362-1.000.

Brunner, Russell K.: *See*—
Halfhill, Martin O.; and Brunner, Russell K., Re. 30,118, Cl. 360-78.000.

Cerberus AG: *See*—
Scheidweiler, Andreas; and Meier, Otto, Re. 30,117, Cl. 250-381.000.

Childers, Thomas W.: *See*—
Herd, David P.; McCaskill, John W.; and Childers, Thomas W., Re. 30,115, Cl. 251-63.600.

Christensen, Phillip V.: *See*—
Andersen, Ariel A., Re. 30,112, Cl. 99-359.000.

Exxon Production Research Company: *See*—
Herd, David P.; McCaskill, John W.; and Childers, Thomas W., Re. 30,115, Cl. 251-63.600.

F. Jos. Lamb Company: *See*—
Bell, William F.; and Van Deberg, Walter H., Re. 30,113, Cl. 198-355.000.

Halfhill, Martin O.; and Brunner, Russell K., to Xerox Corporation. Disc drive linear actuator and control system therefor. Re. 30,118, Cl. 360-78.000.

Herd, David P.; McCaskill, John W.; and Childers, Thomas W., to Exxon Production Research Company. Balanced stem fail-safe valve system. Re. 30,115, Cl. 251-63.600.

Juszak, Joseph J.; and Absler, Howard K., to Uarco Incorporated. Continuous forms assembly. Re. 30,114, Cl. 206-610.000.

Maalouf, George E., to Moore Business Forms, Inc. Carbonless manifold business forms. Re. 30,116, Cl. 282-27.500.

McCaskill, John W.: *See*—
Herd, David P.; McCaskill, John W.; and Childers, Thomas W., Re. 30,115, Cl. 251-63.600.

Meier, Otto: *See*—
Scheidweiler, Andreas; and Meier, Otto, Re. 30,117, Cl. 250-381.000.

Moore Business Forms, Inc.: *See*—
Maalouf, George E., Re. 30,116, Cl. 282-27.500.

Scheidweiler, Andreas; and Meier, Otto, to Cerberus AG. Ionization-type fire or smoke sensing system. Re. 30,117, Cl. 250-381.000.

Tichenor, Clyde L., to Berkey-Colortran, Inc. Compact follow spot. Re. 30,119, Cl. 362-1.000.

Uarco Incorporated: *See*—
Juszak, Joseph J.; and Absler, Howard K., Re. 30,114, Cl. 206-610.000.

Van Deberg, Walter H.: *See*—
Bell, William F.; and Van Deberg, Walter H., Re. 30,113, Cl. 198-355.000.

Xerox Corporation: *See*—
Halfhill, Martin O.; and Brunner, Russell K., Re. 30,118, Cl. 360-78.000.

LIST OF PLANT PATENTEES

Wilson, Richard P. Fruitless olive tree. 4,464, 10-16-79, Cl. 33.000.

LIST OF DESIGN PATENTEES

AB Akerlund & Rausing: *See*—
Nilsson, Kjell; Nilsson, Bertil T.; Hammarlund, Nils T.; and Andersson, Rolf U., 253,168, Cl. D9-219.000.

Adam, John M. Urinal screen. 253,145, 10-16-79, Cl. D6-86.000.

Adam, John M. Urinal screen. 253,146, 10-16-79, Cl. D6-86.000.

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Combined drafting pen holder and container. 253,180, 10-16-79, Cl. D19-85.000.

Andersson, Rolf U.: *See*—
Nilsson, Kjell; Nilsson, Bertil T.; Hammarlund, Nils T.; and Andersson, Rolf U., 253,168, Cl. D9-219.000.

Arsenault, Joseph A. Lug strap. 253,175, 10-16-79, Cl. D15-78.000.

Arsenault, Joseph A. Lug strap. 253,176, 10-16-79, Cl. D15-78.000.

Baugus, Doyle M. Splashguard for bathing enclosures. 253,188, 10-16-79, Cl. D23-69.000.

Bengloff, Adelaide, to Boval Products Corp. Chicken roasting rack. 253,156, 10-16-79, Cl. D7-130.000.

Berlic, France. Combined desk and cabinet unit. 253,152, 10-16-79, Cl. D6-150.000.

Bixler, Loring C.; and Wittner, Ernest, to International Business Machines Corporation. Blood cell separator. 253,190, 10-16-79, Cl. D24-1.100.

Bosler, Ralph E. Holder for small stationary items or the like. 253,179, 10-16-79, Cl. D19-82.000.

Boval Products Corp.: *See*—
Bengloff, Adelaide, 253,156, Cl. D7-130.000.

Brefka, Paul E.: *See*—
Latham, Peter A.; and Brefka, Paul E., 253,189, Cl. D23-97.000.

Chicago Lock Co.: *See*—
Steinbach, Robert L., 253,160, Cl. D8-347.000.

Child Guidance Playthings, Inc.: *See*—
Satten, Michael I., 253,182, Cl. D21-80.000.

China Seas, Inc.: *See*—
Elliott, Inger M.; and Uglow, Helena, 253,153, Cl. D7-55.000.

Conforti, Frederick J., to Pittway Corporation. Housing for a fire and smoke detector. 253,169, 10-16-79, Cl. D10-106.000.

Coons, John C., to Masco Corporation of Indiana. Scanning monitor radio receiver. 253,173, 10-16-79, Cl. D14-72.000.

Crisafulli, Joseph F. Weed removing tool. 253,159, 10-16-79, Cl. D8-12.000.

Dziekonski, Robert, to Salton, Inc. Food grinder. 253,157, 10-16-79, Cl. D7-155.000.

Elliott, Inger M.; and Uglow, Helena, to China Seas, Inc. Condiment container. 253,153, 10-16-79, Cl. D7-55.000.

Emerson Electric Co.: *See*—
Harris, Bruce C.; and Ogrodnik, Robert V., 253,171, Cl. D13-17.000.

Energy Harvesters Corp.: *See*—
Latham, Peter A.; and Brefka, Paul E., 253,189, Cl. D23-97.000.

Foldes, Susan L., to Oggs Manufacturing Corp. Boot. 253,137, 10-16-79, Cl. D2-274.000.

Foldes, Susan L., to Oggs Manufacturing Corp. Sandal. 253,138, 10-16-79, Cl. D2-297.000.

Foldes, Susan L., to Oggs Manufacturing Corp. Sandal. 253,139, 10-16-79, Cl. D2-297.000.

Fournier, Erick-Pierre; and Hill, Ethel V. Toiletry blister package. 253,167, 10-16-79, Cl. D9-185.000.

Fratarcangeli, Victor J., to Quaker Oats Company, The. Toy fork lift. 253,184, 10-16-79, Cl. D21-134.000.

Fratarcangeli, Victor J., to Quaker Oats Company, The. Toy truck. 253,186, 10-16-79, Cl. D21-135.000.
G E P: *See*—
Pasquier, Joseph, 253,140, Cl. D2-321.000.
Goff Products Corporation: *See*—
Goff, Ward R., 253,163, Cl. D8-375.000.
Goff, Ward R., to Goff Products Corporation. Caster frame. 253,163, 10-16-79, Cl. D8-375.000.
Gordon, Kenneth S. Eyeglass frame support rack. 253,141, 10-16-79, Cl. D6-23.000.
GTE Sylvania Incorporated: *See*—
Henkel, Charles E.; and Westlund, Arnold E., Jr., 253,195, Cl. D48-20.00E.
Hammarlund, Nils T.: *See*—
Nilsson, Kjell; Nilsson, Bertil T.; Hammarlund, Nils T.; and Andersson, Rolf U., 253,168, Cl. D9-219.000.
Harris, Bruce C.; and Ogrodnik, Robert V., to Emerson Electric Co. Insulator for electric heating elements. 253,171, 10-16-79, Cl. D13-17.000.
Heckler, Naomi. Magnetic holder for objects. 253,144, 10-16-79, Cl. D6-86.000.
Heckler, Naomi. Magnetic soap holder. 253,147, 10-16-79, Cl. D6-90.000.
Heckler, Naomi. Magnetic soap holder. 253,148, 10-16-79, Cl. D6-90.000.
Heckler, Naomi. Magnetic soap holder. 253,149, 10-16-79, Cl. D6-90.000.
Heckler, Naomi. Magnetic holder for objects. 253,150, 10-16-79, Cl. D6-86.000.
Heckler, Naomi. Magnetic holder for objects. 253,151, 10-16-79, Cl. D6-86.000.
Henkel, Charles E.; and Westlund, Arnold E., Jr., to GTE Sylvania Incorporated. Projection lamp. 253,195, 10-16-79, Cl. D48-20.00E.
Herman, Richard J. Outdoor bench. 253,142, 10-16-79, Cl. D6-60.000.
Hill, Ethel V.: *See*—
Fournier, Erick-Pierre; and Hill, Ethel V., 253,167, Cl. D9-185.000.
Ingram, Charles E. Tie-down bracket. 253,164, 10-16-79, Cl. D8-382.000.
International Business Machines Corporation: *See*—
Bixler, Loring C.; and Wittner, Ernest, 253,190, Cl. D24-1.100.
Jurida Stamping & Mfg. Co. Ltd.: *See*—
Jurida, Vladslav J., 253,155, Cl. D7-106.000.
Jurida, Vladslav J., to Jurida Stamping & Mfg. Co. Ltd. Meat tenderizer. 253,155, 10-16-79, Cl. D7-106.000.
Koh-I-Noor Rapidograph, Inc.: *See*—
Anderka, Gerold, 253,180, Cl. D19-85.000.
Kriesten, Margaret L.: *See*—
Kriesten, Robert R.; and Kriesten, Margaret L., 253,154, Cl. D7-74.000.
Kriesten, Robert R.; and Kriesten, Margaret L. Combined knife rack and storage bin. 253,154, 10-16-79, Cl. D7-74.000.
Latham, Peter A.; and Brefka, Paul E., to Energy Harvesters Corp. Wood stove. 253,189, 10-16-79, Cl. D23-97.000.
Lax, Michael, to Powers-Fiat. Pivot pole door. 253,192, 10-16-79, Cl. D25-48.000.
Lindsay, John. Roller chock. 253,161, 10-16-79, Cl. D8-356.000.
Litman, Alan, to Smith & Wesson Chemical Company, Inc. Night vision scope. 253,177, 10-16-79, Cl. D16-48.000.
Lynch, Robert C. Cartridge belt buckle. 253,136, 10-16-79, Cl. D2-431.000.
Marbury, Thomas K. Solitaire card game board. 253,181, 10-16-79, Cl. D21-57.000.
Marvin M. Stark Research Foundation: *See*—
Stark, Marvin M.; and von Weissenfluh, Hans C., 253,191, Cl. D24-10.000.
Masco Corporation of Indiana: *See*—
Coons, John C., 253,173, Cl. D14-72.000.
Mason, Howard E. Articulated snow blower. 253,174, 10-16-79, Cl. D15-12.000.
McBride, Edward F.: *See*—
Sheehan, Maurice J., 253,162, Cl. D8-366.000.
Nilsson, Bertil T.: *See*—
Nilsson, Kjell; Nilsson, Bertil T.; Hammarlund, Nils T.; and Andersson, Rolf U., 253,168, Cl. D9-219.000.
Nilsson, Kjell; Nilsson, Bertil T.; Hammarlund, Nils T.; and Andersson, Rolf U., to AB Akerlund & Rausing. Packaging container. 253,168, 10-16-79, Cl. D9-219.000.
Oggs Manufacturing Corp.: *See*—
Foldes, Susan L., 253,137, Cl. D2-274.000.
Foldes, Susan L., 253,138, Cl. D2-297.000.
Foldes, Susan L., 253,139, Cl. D2-297.000.
Ogrodnik, Robert V.: *See*—
Harris, Bruce C.; and Ogrodnik, Robert V., 253,171, Cl. D13-17.000.
Osit, Robert, to SCM Corporation. Typewriter. 253,178, 10-16-79, Cl. D18-1.000.
Pansini, Andrew L. Pickup scoop for cleaning swimming pools. 253,158, 10-16-79, Cl. D7-161.000.
Pardo, John, to Procter & Gamble Company, The. Bottle. 253,166, 10-16-79, Cl. D9-129.000.
Pasquier, Joseph, to G E P. Shoe sole. 253,140, 10-16-79, Cl. D2-321.000.
Pauly, Ronald R.; and Rumsey, Royce D., to Tonka Corporation. Toy vehicle. 253,193, 10-16-79, Cl. D21-136.000.
Peterson, Vernon A., to Tonka Corporation. Toy tractor. 253,183, 10-16-79, Cl. D21-132.000.
Pittway Corporation: *See*—
Conforti, Frederick J., 253,169, Cl. D10-106.000.
Powers-Fiat: *See*—
Lax, Michael, 253,192, Cl. D25-48.000.
Procter & Gamble Company, The: *See*—
Pardo, John, 253,166, Cl. D9-129.000.
Quaker Oats Company, The: *See*—
Fratarcangeli, Victor J., 253,184, Cl. D21-134.000.
Fratarcangeli, Victor J., 253,186, Cl. D21-135.000.
Ramirez, Robert. Combined pickup cab carrier and roll bar. 253,170, 10-16-79, Cl. D12-156.000.
Ross, Milton I. Printed circuit card guide. 253,172, 10-16-79, Cl. D13-24.000.
Rumsey, Royce D., to Tonka Corporation. Miniature toy truck cab. 253,185, 10-16-79, Cl. D21-134.000.
Rumsey, Royce D.: *See*—
Pauly, Ronald R.; and Rumsey, Royce D., 253,193, Cl. D21-136.000.
Salton, Inc.: *See*—
Dziekonski, Robert, 253,157, Cl. D7-155.000.
Satten, Michael I., to Child Guidance Playthings, Inc. Toy vehicle. 253,182, 10-16-79, Cl. D21-80.000.
SCM Corporation: *See*—
Osit, Robert, 253,178, Cl. D18-1.000.
Scott, Norman D. Umbrella clamp mounting bracket. 253,165, 10-16-79, Cl. D8-396.000.
Shaw, Jerry; and Solitt, Samuel G. Display unit and light fixtures therefor. 253,143, 10-16-79, Cl. D6-85.000.
Sheehan, Maurice J., to McBride, Edward F., a part interest. Curtain rod bracket. 253,162, 10-16-79, Cl. D8-366.000.
Smith & Wesson Chemical Company, Inc.: *See*—
Litman, Alan, 253,177, Cl. D16-48.000.
Solitt, Samuel G.: *See*—
Shaw, Jerry; and Solitt, Samuel G., 253,143, Cl. D6-85.000.
Stark, Marvin M.; and von Weissenfluh, Hans C., to Marvin M. Stark Research Foundation. Dental matrix band. 253,191, 10-16-79, Cl. D24-10.000.
Steinbach, Robert L., to Chicago Lock Co. Key blank for an axial tumbler-type lock. 253,160, 10-16-79, Cl. D8-347.000.
Stucky, Karl R. Combined shower head and soap dispenser for animals. 253,187, 10-16-79, Cl. D23-35.000.
Tonka Corporation: *See*—
Pauly, Ronald R.; and Rumsey, Royce D., 253,193, Cl. D21-136.000.
Peterson, Vernon A., 253,183, Cl. D21-132.000.
Rumsey, Royce D., 253,185, Cl. D21-134.000.
Uglow, Helena: *See*—
Elliott, Inger M.; and Uglow, Helena, 253,153, Cl. D7-55.000.
von Weissenfluh, Hans C.: *See*—
Stark, Marvin M.; and von Weissenfluh, Hans C., 253,191, Cl. D24-10.000.
Watley, Jerry O. Portable spot light. 253,194, 10-16-79, Cl. D48-20.00K.
Westlund, Arnold E., Jr.: *See*—
Henkel, Charles E.; and Westlund, Arnold E., Jr., 253,195, Cl. D48-20.00E.
Wittner, Ernest: *See*—
Bixler, Loring C.; and Wittner, Ernest, 253,190, Cl. D24-1.100.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 16, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

10 4,170,792
113 4,170,793

CLASS 3

1.91 4,170,794

CLASS 4

145 4,170,795
172 4,170,796
4,170,799
300 4,170,797
319 4,170,798

CLASS 5

45 4,170,800

CLASS 8

2.5 A 4,171,202
10.2 4,171,203

CLASS 9

1.1 4,170,801

CLASS 12

142 RS 4,170,802

CLASS 13

31 EB 4,171,462

CLASS 15

144 R 4,170,803
250.34 4,170,804
321 4,170,805

CLASS 17

63 4,170,806

CLASS 23

230 B 4,171,204
296 4,171,205

CLASS 24

137 R 4,170,807
163 K 4,170,808
230 R 4,170,809
243 K 4,170,810

CLASS 29

25.16 4,170,811
25.42 4,170,812
281.3 4,170,813
432.1 4,170,816
450 4,170,817
452 4,170,814
527.7 4,170,815
571 4,170,818
625 4,170,819
789 4,170,820

CLASS 30

41 4,170,821
43.92 4,170,822

CLASS 32

8 4,170,823

CLASS 33

30 C 4,170,824
125 C 4,170,826
125 R 4,170,827
4,170,828
4,170,829
174 P 4,170,830
178 R 4,170,831
444 4,170,825

CLASS 35

9 A 4,170,832
35 C 4,170,834
36 4,170,833

CLASS 38

77.5 4,170,835

CLASS 40

158 R 4,170,836
209 4,170,838

CLASS 42

65 4,170,837

CLASS 46

17 4,170,839
22 4,170,840
171 4,170,841

CLASS 47

1.1 4,170,842
39 4,170,843
62 4,170,844

CLASS 49

220 4,170,845
303 4,170,846
349 4,170,847
358 4,170,848

CLASS 51

7 4,170,849
165 R 4,170,850
165.71 4,170,851

CLASS 52

71 4,170,852
99 4,170,853
115 4,170,854
400 4,170,855
513 4,170,857
598 4,170,856
735 4,170,858
763 4,170,859

CLASS 53

170 4,170,860
468 4,170,861
471 4,170,862
511 4,170,863

CLASS 55

26 4,171,206
4,171,207
216 4,171,208
466 4,171,209
481 4,171,210
493 4,171,211

CLASS 57

3 4,170,864
6 4,170,865
58.95 4,170,866
245 4,170,867
293 4,170,868

CLASS 58

42 4,170,869
50 R 4,170,870

CLASS 59

82 4,170,871
4,170,872

CLASS 60

39.08 4,170,873
39.18 C 4,170,874
253 4,170,875
547 R 4,170,876
592 4,170,877
641 4,170,878
648 4,170,879

CLASS 62

262 4,170,880
538 4,170,881

CLASS 65

11 R 4,171,212

CLASS 68

133 4,170,882
205 R 4,170,883

CLASS 70

21 4,170,884
97 4,170,885
302 4,170,886

CLASS 71

90 4,171,213
92 4,171,214

CLASS 72

56 4,170,887
82 4,170,888
85 4,170,889
359 4,170,890

CLASS 73

1 R 4,170,891
23 4,170,892
23.1 4,170,893
30 4,170,894
64.3 4,170,895
66 4,170,896
148 4,170,898
189 4,170,899
421.5 R 4,170,901
424 4,170,900
432 R 4,170,902
480 4,170,903
778 4,170,897

CLASS 74

5.6 E 4,170,904
661 4,170,905

CLASS 75

0.5 B 4,171,215
76 4,171,216
122 4,171,217
128 C 4,171,218
130 R 4,171,219

CLASS 81

9.51 4,170,906
57.11 4,170,907
4,170,908
63.2 4,170,909

CLASS 83

71 4,170,910
104 4,170,911
268 4,170,912
441 4,170,913
580 4,170,914
800 4,170,915

CLASS 84

1.24 4,170,916
319 4,170,917

CLASS 85

32 R 4,170,918
71 4,170,919
72 4,170,920

CLASS 87

6 4,170,921

CLASS 89

1.819 4,170,923
7 4,170,922

CLASS 91

232 4,170,924
400 4,170,925

CLASS 92

212 4,170,926

CLASS 93

33 H 4,170,927
37 R 4,170,928
53 SD 4,170,929

CLASS 96

29 D 4,171,220
48 HD 4,171,221
75 4,171,222
76 R 4,171,223
94 R 4,171,224

CLASS 98

40 D 4,170,930

CLASS 99

312 4,170,931
326 4,170,932
349 4,170,933
359 Re.30,112

CLASS 100

39 4,170,936
100 4,170,934
121 4,170,935

CLASS 101

99 4,170,937
111 4,170,938

CLASS 102

28 S 4,170,939
56 SC 4,170,940
202 4,170,941

CLASS 104

7 B 4,170,942
56 4,170,943
138 R 4,170,944

CLASS 105

133 4,170,945
493 4,170,946

CLASS 106

1.23 4,171,225
15.05 4,171,226
85 4,171,227
288 B 4,171,228

CLASS 109

16 4,170,947

CLASS 111

7.1 4,170,948

CLASS 112

79 R 4,170,949
158 F 4,170,950
278 4,170,951

CLASS 114

74 A 4,170,952
144 E 4,170,953
265 4,170,954

CLASS 116

67 R 4,170,955
218 4,170,956

CLASS 118

60 4,170,957
325 4,170,958
627 4,170,959

CLASS 119

103 4,170,961
109 4,170,962

CLASS 122

33 4,170,963
235 G 4,170,964

CLASS 123

32 EE 4,170,965
4,170,967
4,170,969
32 SA 4,170,966
32 SP 4,170,968
4,170,979
53 BA 4,170,970
119 A 4,170,971
4,170,972
4,170,573
139 AT 4,170,974
139 AW 4,170,975
140 FG 4,170,976
148 CC 4,170,977
198 A 4,170,960
239 4,170,978

CLASS 124

41 A 4,170,980

CLASS 126

43 4,170,981
99 A 4,170,982
424 4,170,985
432 4,170,984
450 4,170,983

CLASS 128

1 R 4,170,986
24 R 4,170,988
52 4,170,989
92 B 4,170,990
134 4,170,991
214 C 4,170,994
214 R 4,170,993
346 4,170,995
349 R 4,170,996
395 4,170,997
400 4,170,998
419 PG 4,170,999
665 4,170,987
702 4,170,992

CLASS 131

170 A 4,171,000

CLASS 132

53 4,171,001

CLASS 134

166 R 4,171,002

CLASS 136

89 PC 4,171,003

CLASS 137

116 4,171,004
119 4,171,005
595 4,171,006
599 4,171,007

CLASS 139

339 4,171,008
425 A 4,171,009

CLASS 141

369 4,171,010

CLASS 148

1.5 4,171,229
6.1 4,171,230
6.21 4,171,231
24 4,171,232
36 4,171,233
175 4,171,234
4,171,235

CLASS 150

34 4,171,011

CLASS 151

14 R 4,171,012

CLASS 156

69 4,171,236
115 4,171,237
173 4,171,238
461 4,171,239
556 4,171,241
630 4,171,240
657 4,171,242

CLASS 159

48 R 4,171,243

CLASS 160

22 4,171,013

CLASS 165

11 4,171,014
181 4,171,015

CLASS 166

68 4,171,016
266 4,171,017
315 4,171,018
341 4,171,019

CLASS 169

49 4,171,020

CLASS 172

63 4,171,021
311 4,171,022
801 4,171,023

CLASS 173

117 4,171,024

CLASS 174

120 R 4,171,463
126 S 4,171,464

CLASS 175

65 4,171,025

CLASS 177

25 4,171,026

CLASS 179

1 P 4,171,465
15 AW 4,171,468
15 BM 4,171,467
15 BY 4,171,466
18 BA 4,171,469

CLASS 180

9.54 4,171,027
54 R 4,171,029
179 4,171,030
235 4,171,028

CLASS 181

102 4,171,031

CLASS 182

3 4,171,032
63 4,171,033

CLASS 184

6.24 4,171,034

CLASS 188

73.3 4,171,035
73.5 4,171,037
196 R 4,171,036

CLASS 192

70.13 4,171,038

CLASS 194

9 T 4,171,039

CLASS 198

302 4,171,040
355 Re.30,113
379 4,171,041
386 4,171,042
430 4,171,043
834 4,171,044
853 4,171,045

CLASS 200

6 A 4,171,470
38 D 4,171,471
47 4,171,472
4,171,473
144 B 4,171,474
241 4,171,475

CLASS 203

68 4,171,245

CLASS 204

1 T 4,171,246
34 4,171,247
89 4,171,248
105 R 4,171,249
119 4,171,250
158 R 4,171,251
159.23 4,171,252
195 S 4,171,253
197 4,171,254
238 4,171,255
239 4,171,256

CLASS 206

193 4,171,046
210 4,171,047
328 4,171,049
390 4,171,048
463 4,171,050
610 Re.30,114

CLASS 208

120 4,171,257
139 4,171,259
144 4,171,258
240 4,171,260

CLASS 209

166 4,171,261
542 4,171,051
555 4,171,262

CLASS 210

8 4,171,263
40 4,171,264
56 4,171,265
230 4,171,266

CLASS 211

162 4,171,052

CLASS 212

58 A 4,171,053

CLASS 215

12 R 4,171,056
211 4,171,057

CLASS 217

12 R 4,171,058

CLASS 219

56.21 4,171,477

400 4,171,478

CLASS 220

4 F 4,171,059
254 4,171,060
256 4,171,061
270 4,171,062
307 4,171,063
418 4,171,064

CLASS 221

7 4,171,065
150 A 4,171,066

CLASS 222

1 4,171,067
4,171,069
133 4,171,070
167 4,171,071
309 4,171,073
326 4,171,072
402.22 4,171,074
456 4,171,075

CLASS 223

72 4,171,076

CLASS 224

42.03 B 4,171,077
42.46 R 4,171,078
45 S 4,171,079

CLASS 225

2 4,171,080
97 4,171,081

CLASS 226

64 4,171,068
196 4,171,082

CLASS 227

69 4,171,083

CLASS 229

1.5 B 4,171,085
43 4,171,084

CLASS 232

35 4,171,086

CLASS 235

449 4,171,479

CLASS 236

68 R 4,171,087

CLASS 237

2 B 4,171,088
55 4,171,089

CLASS 238

10 R 4,171,090

CLASS 239

8 4,171,091
70 4,171,092
127.3 4,171,093
186 4,171,094
200 4,171,095
291 4,171,096
341 4,171,097
533.8 4,171,099
700 4,171,100
708 4,171,098

CLASS 241

30 4,171,101
70 4,171,102
152 A 4,171,103
160 4,171,104

CLASS 242

18 R 4,171,105
66 4,171,106
67.1 R 4,171,107
84.2 G 4,171,108
107 4,171,109
192 4,171,110
201 4,171,111

CLASS 244

12.5 4,171,112
83 G 4,171,113
116 4,171,114
181 4,171,115

CLASS 248

464 4,171,116
495 4,171,117

CLASS 249

183 4,171,118

CLASS 250

213 VT 4,171,480
223 B 4,171,481
296 4,171,482
321 4,171,483
355 4,171,484
359 4,171,485
381 Re.30,117
4,171,486
408 4,171,487
421 4,171,488
445 T 4,171,476
510 4,171,489
564 4,171,490

CLASS 251

63.6 Re.30,115
321 4,171,119

CLASS 252

8.6 4,171,267
32.7 E 4,171,268
33 4,171,269
42.7 4,171,270
46.6 4,171,271
46.7 4,171,272
51.5 A 4,171,273
62.1 L 4,171,275
62.1 P 4,171,274
88 4,171,276
99 4,171,277
102 4,171,278
148 4,171,279
186 4,171,280
188 4,171,281
356 4,171,282
428 4,171,283
429 B 4,171,284
455 R 4,171,285
455 Z 4,171,286
462 4,171,287
4,171,288
466 PT 4,171,289
4,171,290
554 4,171,291

CLASS 254

1 4,171,120
28 4,171,121
67 4,171,122
134.3 FT 4,171,123

CLASS 260

22 A 4,171,293
22 CQ 4,171,294
23 H 4,171,295
29.6 WB 4,171,292
29.6 WQ 4,171,296
31.2 MR 4,171,308
31.2 R 4,171,297
45.85 H 4,171,298
112.5 R 4,171,299
145 B 4,171,300
154 4,171,301
239 A 4,171,302
239.1 4,171,303
4,171,304
239.3 R 4,171,305
239.55 R 4,171,306
314.5 4,171,309
326 C 4,171,310
326.34 4,171,311
340.2 4,171,312
343 4,171,313
343.41 4,171,314
345.3 4,171,315
346.75 4,171,316
397.47 4,171,317
404 4,171,318
413 4,171,319
449 R 4,171,320
455 A 4,171,321
465.6 4,171,322
501.19 4,171,323
513 B 4,171,324
551 C 4,171,325
586 C 4,171,326
586 R 4,171,327
604 R 4,171,328
946 4,171,331

CLASS 261

78 R 4,171,332
94 4,171,333
112 4,171,334
155 4,171,335

CLASS 264

37 4,171,336
56 4,171,337
211 4,171,338
332 4,171,339

CLASS 266

48 4,171,124
250 4,171,126

CLASS 267

102 4,171,125

CLASS 270

58 4,171,127

CLASS 271

3 4,171,128
6 4,171,129
10 4,171,130
236 4,171,131

CLASS 272

70.3 4,171,132

CLASS 273

127 C 4,171,133
181 R 4,171,134
237 4,171,135

CLASS 274

23 A 4,171,136

CLASS 277

25 4,171,137

CLASS 280

605 4,171,138
652 4,171,139
749 4,171,140
756 4,171,141

CLASS 282

27.5 Re.30,116

CLASS 285

10 4,171,142

CLASS 290

1 R 4,171,491

CLASS 293

121 4,171,143

CLASS 294

30 4,171,144

CLASS 296

78.1 4,171,145

CLASS 299

2 4,171,146
39 4,171,147
61 4,171,148

CLASS 301

37 P 4,171,149

CLASS 307

310 4,171,492

CLASS 310

13 4,171,493
52 4,171,494
155 4,171,495
219 4,171,496

CLASS 312

107 4,171,150
236 4,171,151

CLASS 313

113 4,171,497
229 4,171,498
318 4,171,499
331 4,171,500
486 4,171,501
517 4,171,502

CLASS 315

248 4,171,503
378 4,171,504

CLASS 318

316 4,171,505
338 4,171,506
345 C 4,171,507

CLASS 320

2 4,171,508

CLASS 323

75 C 4,171,509
89 M 4,171,510

CLASS 324

133 4,171,512
313 4,171,511

CLASS 325

32 4,171,513
121 4,171,514
436 4,171,515
466 4,171,516

CLASS 328

72 4,171,517

CLASS 331

94.5 G 4,171,518

CLASS 337

25 4,171,519

CLASS 339

272 A 4,171,152

CLASS 340

152 T 4,171,520
347 AD 4,171,521
347 P 4,171,522
654 4,171,523
713 4,171,524

CLASS 343

853 4,171,525

CLASS 346

23 4,171,526
75 4,171,527

CLASS 351

158 4,171,153

CLASS 354

23 R 4,171,154
25 4,171,155
209 4,171,156

CLASS 355

3 TR 4,171,157

CLASS 356

239 4,171,158
349 4,171,159
375 4,171,160
383 4,171,161
401 4,171,162

CLASS 357

13 4,171,528

CLASS 358

209 4,171,529

CLASS 360

70 4,171,530
78 Re.30,118
99 4,171,531

CLASS 361

13 4,171,532
22 4,171,533

CLASS 362

1 Re.30,119
183 4,171,534
406 4,171,535

CLASS 364

200 4,171,536
704 4,171,537
900 4,171,538
4,171,539
4,171,540
4,171,541

CLASS 366

145 4,171,163
152 4,171,164
186 4,171,165
316 4,171,166

CLASS 400

702 4,171,167

CLASS 401

35 4,171,168
41 4,171,169
65 4,171,170
150 4,171,171

CLASS 403

71 4,171,172
189 4,171,173

CLASS 405

25 4,171,174
170 4,171,175
257 4,171,176

CLASS 408

218 4,171,177

CLASS 414

45 4,171,178
85 4,171,179
412 4,171,055
502 4,171,180
636 4,171,181
687 4,171,054

CLASS 415

90 4,171,182

CLASS 416

94 4,171,183
97 R 4,171,184

CLASS 417

12 4,171,185
17 4,171,186
170 4,171,187
282 4,171,188
332 4,171,189
350 4,171,190
539 4,171,191

CLASS 418

32 4,171,192

CLASS 422

36 4,171,340
98 4,171,341

CLASS 423

160 4,171,342
359 4,171,343
364 4,171,344
450 4,171,345
496 4,171,346
539 4,171,347
570 4,171,348
574 L 4,171,349
580 4,171,350

CLASS 424

1 4,171,351
9 4,171,352
88 4,171,353
92 4,171,354
174 4,171,355
180 4,171,356
224 4,171,357
243 4,171,358
244 4,171,359
245 4,171,360
246 4,171,361
4,171,362
4,171,368
251 4,171,363
272 4,171,364
273 P 4,171,365
4,171,367
273 R 4,171,366
274 4,171,369
282 4,171,370
4,171,371
4,171,372
301 4,171,373
304 4,171,374
305 4,171,375
308 4,171,376
319 4,171,377
331 4,171,378

CLASS 425

71 4,171,193
88 4,171,194
141 4,171,195
209 4,171,196
321 4,171,197
377 4,171,198

CLASS 426

2 4,171,379
95 4,171,380
105 4,171,381
243 4,171,382
623 4,171,383
4,171,384
658 4,171,385
4,171,386

CLASS 427

54 4,171,387
129 4,171,388
130 4,171,389
244 4,171,390
246 4,171,391
321 4,171,392
354 4,171,393
374 C 4,171,394

CLASS 428

95 4,171,395
171 4,171,396
195 4,171,397
4,171,398
336 4,171,399
357 4,171,400
369 4,171,401
4,171,402
392 4,171,403
413 4,171,404
443 4,171,405
447 4,171,406
500 4,171,407
539 4,171,408

CLASS 429

17 4,171,409

CLASS 431

351 4,171,199

CLASS 432

13 4,171,200
59 4,171,201

CLASS 435

188 4,171,244

CLASS 521

52 4,171,410
98 4,171,411

CLASS 525

180 4,171,330
329 4,171,412
4,171,413

CLASS 526

185 4,171,414
243 4,171,415
245 4,171,416
4,171,417
287 4,171,418

CLASS 528

67 4,171,419
89 4,171,420
194 4,171,421
289 4,171,423
292 4,171,424
312 4,171,426
315 4,171,425
437 4,171,422
500 4,171,427
502 4,171,428

CLASS 536

1 4,171,429
8 4,171,430
23 4,171,431
26 4,171,432

CLASS 544

4,171,433
27 4,171,434
29 4,171,435
99 4,171,436
4,171,437
105 4,171,438
4,171,439
277 4,171,440
286 4,171,441
334 4,171,442

CLASS 546

66 4,171,443
250 4,171,444
251 4,171,445

CLASS 548

235 4,171,307
372 4,171,446

CLASS 560

121 4,171,447
158 4,171,448
161 4,171,449
204 4,171,450
4,171,451
253 4,171,452

CLASS 562

406 4,171,453
546 4,171,454

CLASS 568

625 4,171,455
663 4,171,456
674 4,171,457
735 4,171,458
4,171,459
838 4,171,460
902 4,171,461

CLASS 585

487 4,171,329

D2—	274	253,137			253,146		130	253,156	D9—	129	253,166			253,176		135	253,186
	297	253,138			253,150		155	253,157		185	253,167	D16—	48	253,177		136	253,193
		253,139			253,151		161	253,158		219	253,168	D18—	1	253,178	D23—	35	253,187
	321	253,140		90	253,147	D8—	12	253,159	D10—	106	253,169	D19—	82	253,179		69	253,188
	431	253,136			253,148		347	253,160	D12—	156	253,170		85	253,180		97	253,189
D6—	23	253,141			253,149		356	253,161	D13—	17	253,171	D21—	57	253,181	D24—	1.1	253,190
	60	253,142		150	253,152		366	253,162		24	253,172		80	253,182		10	253,191
	85	253,143	D7—	55	253,153		375	253,163	D14—	72	253,173		132	253,183	D25—	48	253,192
	86	253,144		74	253,154		382	253,164	D15—	12	253,174		134	253,184	D48—	20 E	253,195
		253,145		106	253,155		396	253,165		78	253,175			253,185		20 K	253,194

CLASSIFICATION OF PLANTS

P.—	33	4,464															

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

6 : 4,170,793
4,170,896
4,170,914
4,170,922
4,170,933
4,170,935
4,171,235
4,171,244
4,171,280
4,171,347
4,171,426
4,171,463
4,171,503
4,171,509
4,171,520
4,171,526
4,171,537
8 : 4,170,986
9 : 4,171,486
01 : 4,170,798
4,171,001
4,171,228
04 : 4,171,115
4,171,145
05 : 4,170,801
06 : Re.30,118
Re.30,119
4,170,818
4,170,824
4,170,832
4,170,837
4,170,842
4,170,885
4,170,918
4,170,919
4,170,920
4,170,943
4,170,948
4,170,952
4,170,953
4,170,987
4,170,991
4,170,997
4,170,998
4,171,013
4,171,018
4,171,042
4,171,051
4,171,060
4,171,073
4,171,077
4,171,110
4,171,141
4,171,144
4,171,146
4,171,158
4,171,198
4,171,257
4,171,263
4,171,285
4,171,299
4,171,311
4,171,380
4,171,383
4,171,384
4,171,398
4,171,425
4,171,484
4,171,485
4,171,511
4,171,521
4,171,525
4,171,529
08 : 4,170,844
4,170,897
4,170,909
4,171,165
4,171,238
4,171,466
4,171,527
09 : 4,170,812
4,170,821
4,170,835
4,170,873
4,170,913
4,170,995
4,171,119
4,171,127
4,171,128
4,171,129
4,171,183
4,171,199
4,171,251
4,171,411
4,171,418
4,171,428
4,171,471
10 : 4,171,391
4,171,502
11 : 4,171,171
12 : 4,170,929
4,170,983
4,170,989
4,171,070
4,171,093
4,171,114
4,171,342
4,171,469
13 : 4,170,868
4,171,166
4,171,377
4,171,395
15 : 4,171,041
16 : 4,170,817
17 : Re.30,114
4,170,858
4,170,884
4,170,899
4,170,996
4,171,015
4,171,017
4,171,023
4,171,046
4,171,087
4,171,116
4,171,117
4,171,121
4,171,124
4,171,133
4,171,181
4,171,204
4,171,284
4,171,290
4,171,296
4,171,312
4,171,367
4,171,381
4,171,434
4,171,475
4,171,523
18 : 4,170,866
4,171,005
4,171,050
4,171,057
4,171,217
4,171,310
4,171,315
4,171,358
4,171,361
4,171,364
4,171,392
4,171,394
4,171,432
4,171,504
19 : 4,170,845
4,171,172
4,171,538
20 : 4,171,022
4,171,452
21 : 4,171,210
4,171,211
4,171,229
4,171,533
22 : 4,171,045
4,171,061
4,171,065
4,171,259
4,171,289
4,171,448
23 : 4,170,802
4,171,063
24 : 4,170,875
4,170,904
4,170,910
4,171,072
4,171,085
4,171,097
4,171,457
25 : 4,170,833
4,170,851
4,170,855
4,170,921
4,170,992
4,171,034
4,171,135
4,171,151
4,171,159
4,171,164
4,171,167
4,171,202
4,171,253
4,171,292
4,171,420
4,171,462
4,171,518
4,171,528
26 : Re.30,113
4,170,838
4,170,847
4,170,882
4,170,888
4,170,917
4,170,926
4,170,946
4,170,977
4,171,012
4,171,038
4,171,039
4,171,044
4,171,123
4,171,134
4,171,149
4,171,153
4,171,169
4,171,208
4,171,267
4,171,319
4,171,327
4,171,405
4,171,431
4,171,436
4,171,437
4,171,447
4,171,449
4,171,453
4,171,456
4,171,460
4,171,495
27 : 4,170,956
4,170,999
4,171,024
4,171,069
4,171,082
4,171,089
4,171,192
4,171,317
4,171,382
4,171,397
4,171,536
28 : 4,171,535
29 : 4,170,856
4,170,923
4,171,076
4,171,078
4,171,084
4,171,092
4,171,213
4,171,379
4,171,385
4,171,386
31 : 4,171,033
4,171,118
4,171,173
4,171,353
32 : 4,171,079
33 : 4,170,839
4,170,912
4,171,513
4,171,514
4,171,519
34 : 4,170,823
4,170,843
4,170,853
4,170,861
4,170,865
4,170,878
4,170,931
4,170,993
4,171,006
4,171,010
4,171,047
4,171,056
4,171,074
4,171,075
4,171,195
4,171,240
4,171,254
4,171,260
4,171,272
4,171,286
4,171,287
4,171,288
4,171,313
4,171,314
4,171,318
4,171,338
4,171,344
4,171,356
4,171,373
4,171,389
4,171,414
4,171,440
4,171,441
4,171,489
4,171,539
35 : 4,171,464
36 : Re.30,116
4,170,809
4,170,886
4,170,951
4,170,955
4,170,957
4,171,004
4,171,020
4,171,086
4,171,109
4,171,113
4,171,122
4,171,131
4,171,168
4,171,221
4,171,246
4,171,269
4,171,270
4,171,271
4,171,273
4,171,274
4,171,275

	4,171,282		4,170,916		4,171,032		4,171,322		4,171,404		4,171,256
	4,171,307		4,170,960		4,171,147		4,171,352	47 :	4,171,346	50 :	4,170,982
	4,171,329		4,170,962		4,171,245		4,171,359	48 :	Re.30,115		4,171,071
	4,171,337		4,170,970		4,171,531		4,171,360		4,170,825	51 :	4,170,862
	4,171,339		4,171,011	41 :	4,170,980		4,171,362		4,170,893		4,170,984
	4,171,341		4,171,036		4,171,058		4,171,368		4,170,894		4,171,048
	4,171,348		4,171,062		4,171,186		4,171,413		4,170,901		4,171,242
	4,171,363		4,171,080		4,171,515		4,171,417		4,170,907		4,171,409
	4,171,365		4,171,096	42 :	4,170,811		4,171,433		4,170,908		4,171,422
	4,171,371		4,171,101		4,170,819		4,171,450		4,171,019		4,171,516
	4,171,376		4,171,126		4,170,891		4,171,461		4,171,025	53 :	4,170,900
	4,171,378		4,171,191		4,170,895		4,171,470		4,171,142		4,171,095
	4,171,388		4,171,231		4,170,961		4,171,474		4,171,185		4,171,139
	4,171,393		4,171,237		4,171,180		4,171,541		4,171,187		4,171,243
	4,171,399		4,171,268		4,171,188	44 :	4,170,831		4,171,189		4,171,332
	4,171,415		4,171,333		4,171,206		4,170,841		4,171,190	54 :	4,171,053
	4,171,429		4,171,350		4,171,207		4,170,871		4,171,209		4,171,423
37 :	4,170,808		4,171,400		4,171,215		4,170,872		4,171,248	55 :	4,170,964
	4,171,402		4,171,403		4,171,227	45 :	4,170,859		4,171,250		4,171,052
	4,171,534		4,171,454		4,171,233		4,170,867		4,171,264		4,171,106
39 :	4,170,820		4,171,467		4,171,252		4,170,883		4,171,279		4,171,120
	4,170,852		4,171,493		4,171,276		4,170,911		4,171,343		4,171,236
	4,170,860		4,171,522		4,171,316		4,170,928		4,171,472		4,171,239
	4,170,869	40 :	4,170,795		4,171,320		4,171,387	49 :	Re.30,112		4,171,331

DESIGN PATENTS

4 :	253,179		253,151	24 :	253,142		253,193		253,167	42 :	253,137
	253,187		253,154	25 :	253,156	29 :	253,194		253,182		253,138
6 :	253,174		253,158		253,161	30 :	253,159		253,184		253,139
	253,191	10 :	253,172		253,162	33 :	253,175		253,186		253,177
06 :	253,141	12 :	253,103		253,189		253,176		253,190		253,178
	253,144	13 :	253,145	26 :	253,163	34 :	253,157		253,192	47 :	253,188
	253,147		253,146		253,164	36 :	253,152	37 :	253,181	48 :	253,170
	253,148	17 :	253,160	27 :	253,183		253,153	39 :	253,143	51 :	253,171
	253,149		253,169		253,185		253,166		253,173	56 :	253,136
	253,150	21 :	253,195								

PLANT PATENTS

48 :	4,464										

U. S. GOVERNMENT PRINTING OFFICE : O - 1979

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

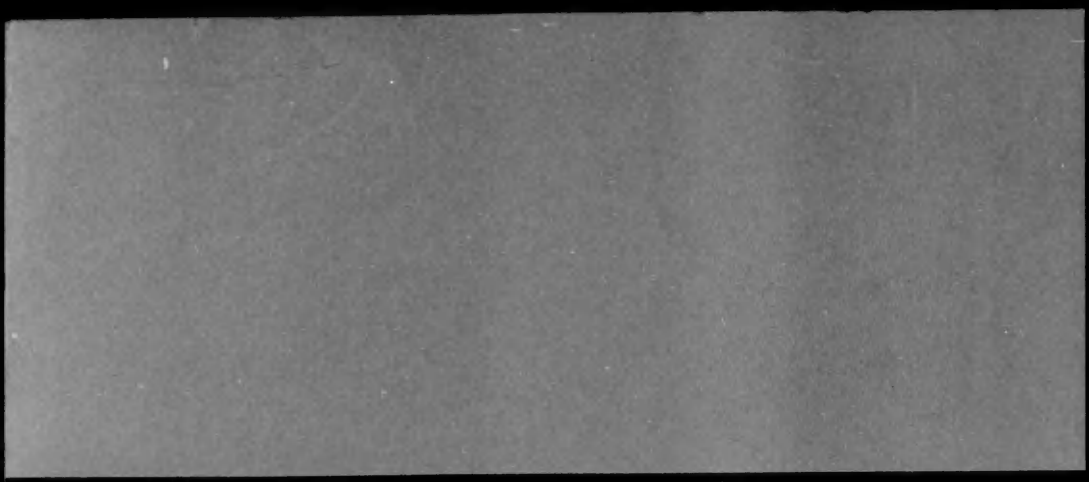
PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402



U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, *Secretary*

PATENT AND TRADEMARK OFFICE
Lutrelle F. Parker, *Acting Commissioner*